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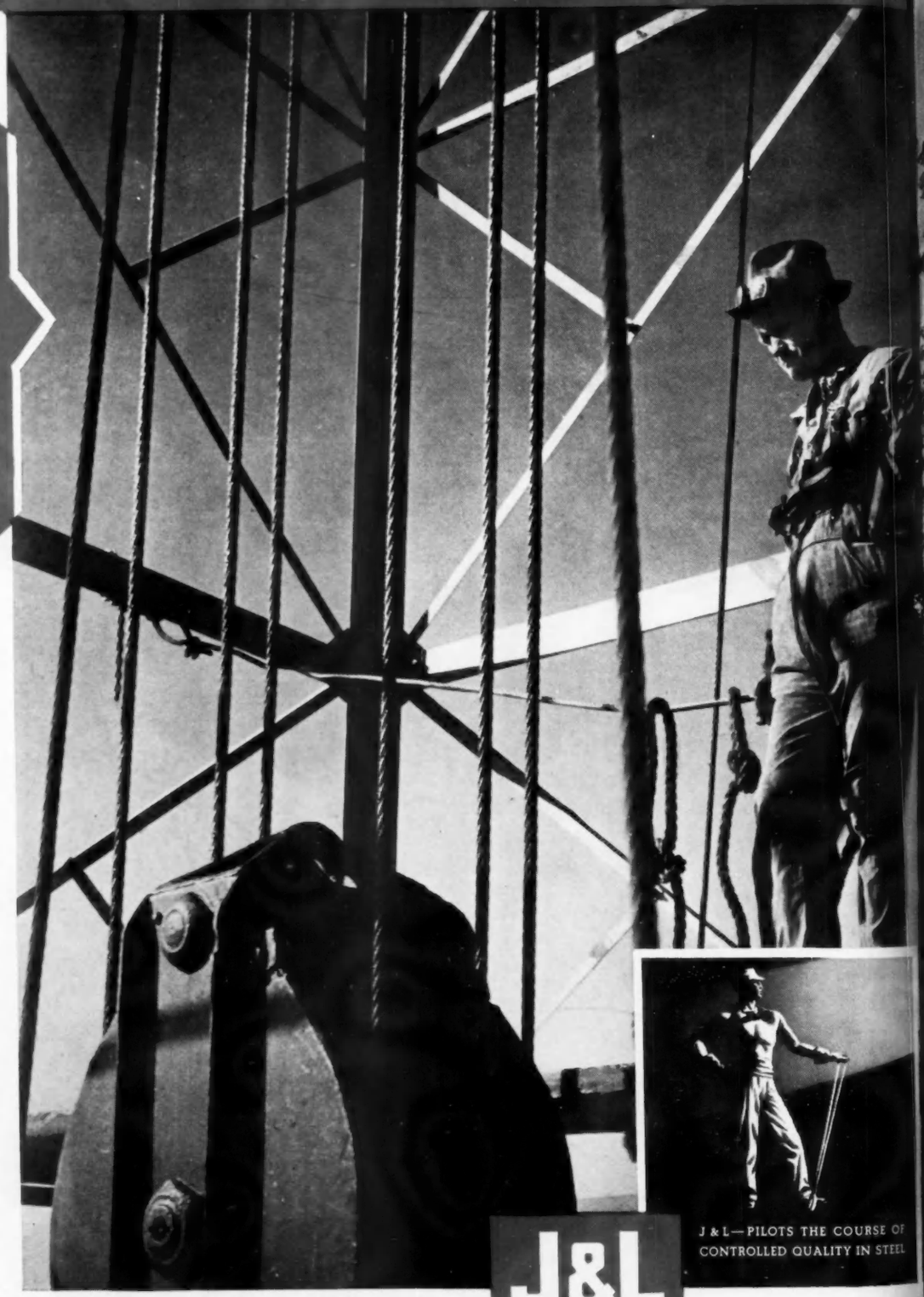

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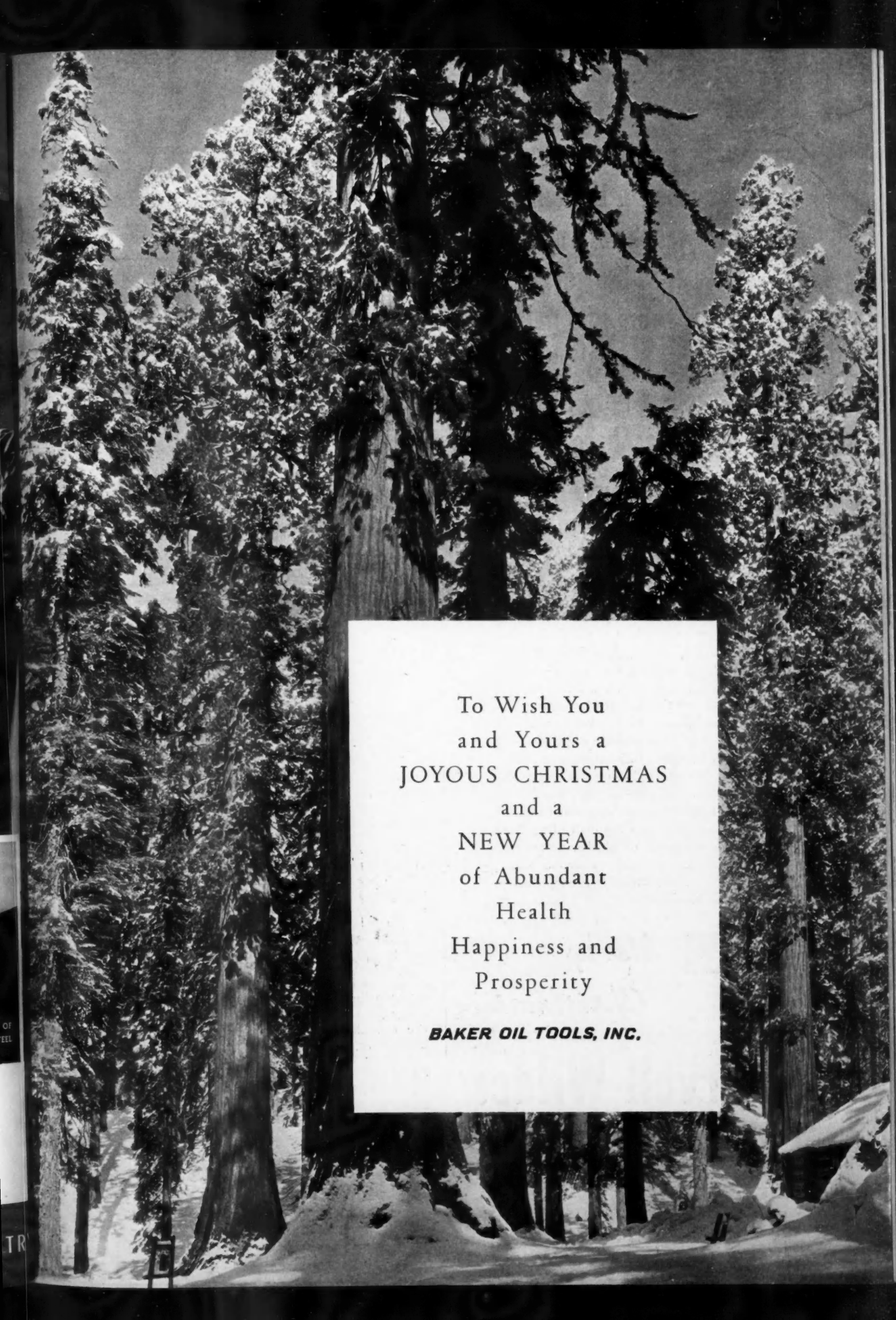
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The thought of divine purpose is awesome. We seem to be in closer communion with it at this time of year. Whether we are close to the terrifying roar following the tapping by the big drill of age-long stored up forces, or whether we are resting in quiet meditation after our tour is over . . . our thoughts are uplifted at Christmas-Tide.

Merry Christmas

Norvell-Wilder Supply Company

LOOKING AHEAD

WITH THE EDITOR

NORTH TEXAS, primarily a shallow stripper-well district for many years, is staging a remarkable comeback. Three years of orderly exploration and development of deep sand and lime horizons underlying the region have contributed adequate fields and production trends to enable the district to expand drilling and oil output substantially, and to hold prospects for additional growth.

Crude yield from the shallow areas is now of secondary importance, as the deep fields developed within the past three years account for more than 50 percent of the North Texas allowable. More than half of the current drilling activity is projected to the deeper pay levels.

The year 1940 should see the completion of from 25 to 30 percent more wells than did 1939, while the volume of footage drilled, due to the increase in producing levels, may be 50 percent greater. Production is running 25 percent higher than a year ago.

Despite the expansion cited above, substantial increase in field activity is inevitable in North Texas. The total volume of undrilled proven and semi-proven acreage approximates record levels. Demand for the high-gravity oil exceeds proration allowables, and promises to become greater if the decline in Illinois continues. North Texas operators as a whole are aggressive developers of producing properties, and can arrange for reasonable financing of projected drilling programs now that the daily allowable of deep wells is at the highest average recorded since the inception of deep production on a district-wide basis. Greater portion of the deep oil is 40-gravity or better, thereby commanding the top posting of $1.03 per barrel. An inventory of the results gained from systematic exploration of the Lower Pennsylvanian beds in recent years has revealed that the neglected deep oil zones are scattered throughout the district, and may approach the aggregate producing area and crude recovery of the shallow fields.

In view of these important developments, it is fitting that an oil-trade publication present a comprehensive feature article on the North Texas region. THE OIL WEEKLY will do this next week.

The issue will contain a discovery tabulation that will be the first of its kind published on North Texas. THE OIL WEEKLY has assembled this historical information over the entire period of deep drilling in this district. Also, there will be published a two-color insert map of the area, which will designate between the old shallow fields and newer deep producing horizons.

THE FIRST OF A SERIES of two articles of interest to engineers studying recycling operations will also appear in next week's issue. Ideal gas laws

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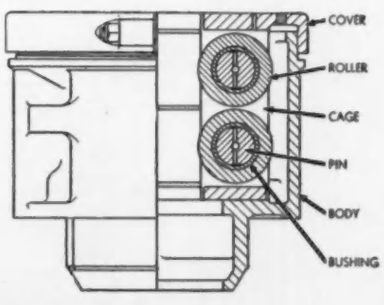

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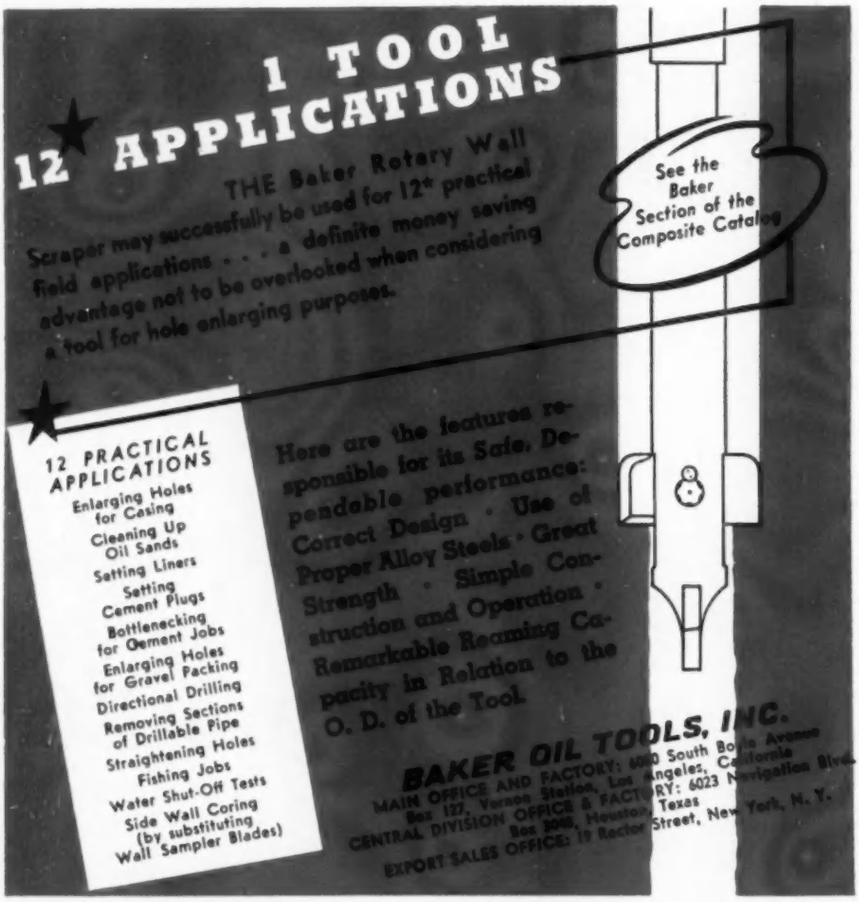
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Professor of Geology, University of Wisconsin

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9. Sediments of Chemical Deposition
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Looking Ahead
WITH THE EDITOR

provided a most convenient approximation as long as operations were conducted at low pressures. But with the discovery of distillate producing fields, which invariably required high-pressure operations, it was found that at pressures in excess of about 50 pounds per square inch, the deviations of natural gas from the ideal laws were so great that modern practice required more accurate data.

Dr. George Granger Brown, University of Michigan, is the author of the two articles that will suggest means of calculating the properties of higher-pressured gas reservoirs.

In all cases, the greatest accuracy can be attained only by careful experimental data on the material in question. Frequently such data are unavailable, and it becomes necessary to calculate the properties of natural gas for meter corrections, compressor capacity, etc. In such instances, the forthcoming two articles will prove helpful, for it proposes a method for computing the pressure, volume, and temperature relationship of natural gas.

DRILLING CONTRACTORS' NOTEBOOK, a section inaugurated by THE OIL WEEKLY during the past year, will be continued during 1941. This was decided at the annual editorial conference of the magazine, held 10 days ago.

This section consists of illustrated short items, hints and ideas for men in the drilling branch of the industry. During the past 10 months 196 items were published in this section, and this rate of presentation will be maintained.

We invite our subscribers to submit items for this section. No doubt many of you have worked out or have seen some interesting and valuable ideas or short cuts of this nature, and you probably are very proud of them. Why not pass them along to the industry? Send them to our Drilling Contractors' Notebook department. A good snapshot and a description telling the usefulness of the idea and how it is applied is all that is necessary.

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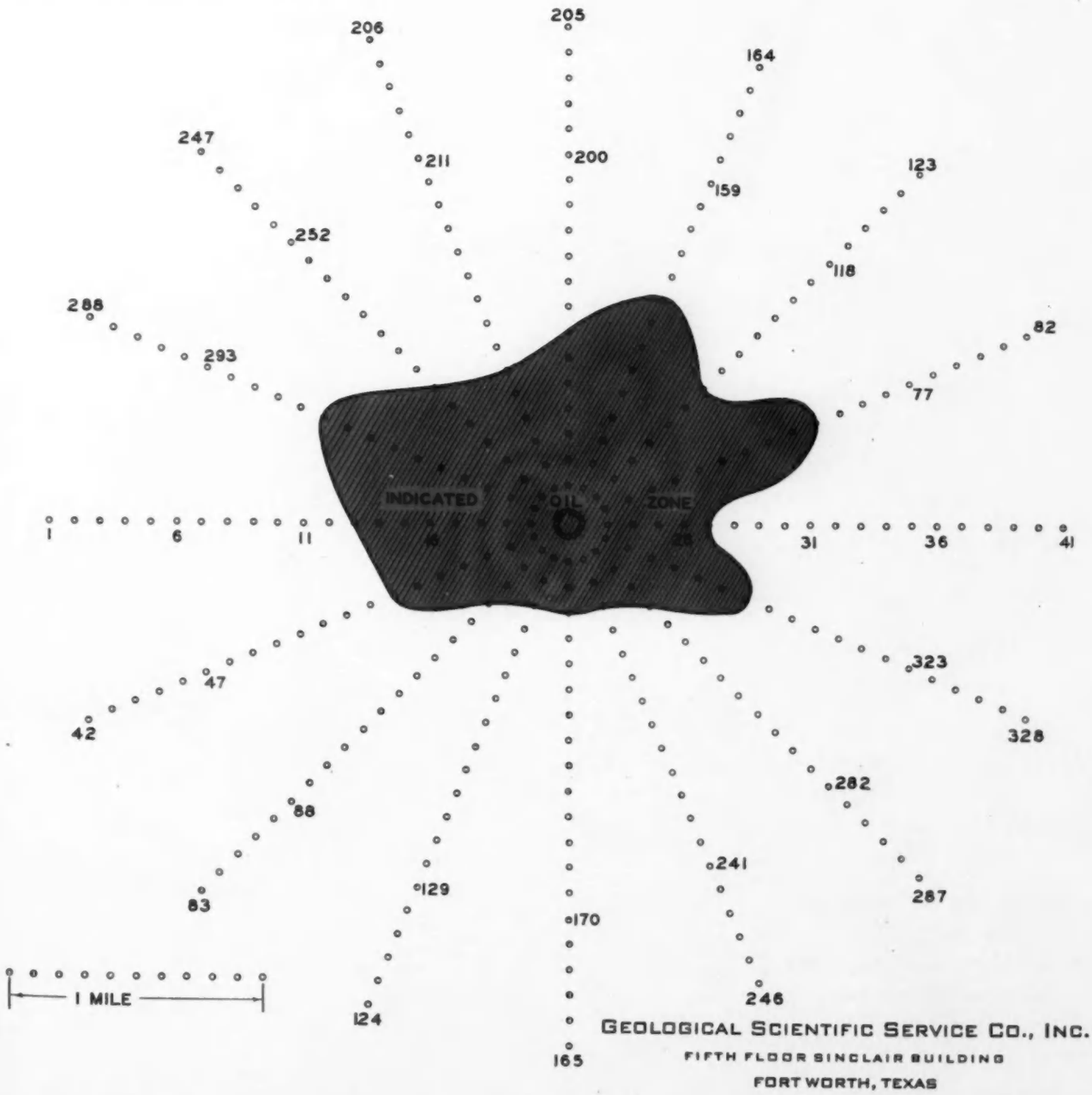

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The Oil Man's Calendar

DEC. 26–28	Geological Society of America, Austin, Tex.
1941 JAN. 16–17	Liquefied Petroleum Gas Association, Eastern Section, New York.
FEB. 22	American Institute of Mining & Metallurgical Engineers, New York.
22	North Texas Oil & Gas Association, Wichita Falls.
24–25	Liquefied Petroleum Gas Association, Chicago.
27–28	American Petroleum Institute, Division of Production, Southwestern District, Shreveport.
MAR. 11	American Petroleum Institute, Division of Production, Spring Meeting, Pacific Coast District, Los Angeles.
APRIL 2– 4	American Association of Petroleum Geologists, Twenty-sixth Annual Meeting, Houston.
17–18	American Petroleum Institute, Division of Production, Eastern District, Pittsburgh.
23–25	Petroleum Industry Electrical Association, Tulsa.
23–25	Natural Gasoline Association of America, Dallas.
25–26	National Petroleum Association, Cleveland.
25–26	Petroleum & Natural Gas Conference, State College, Pa.

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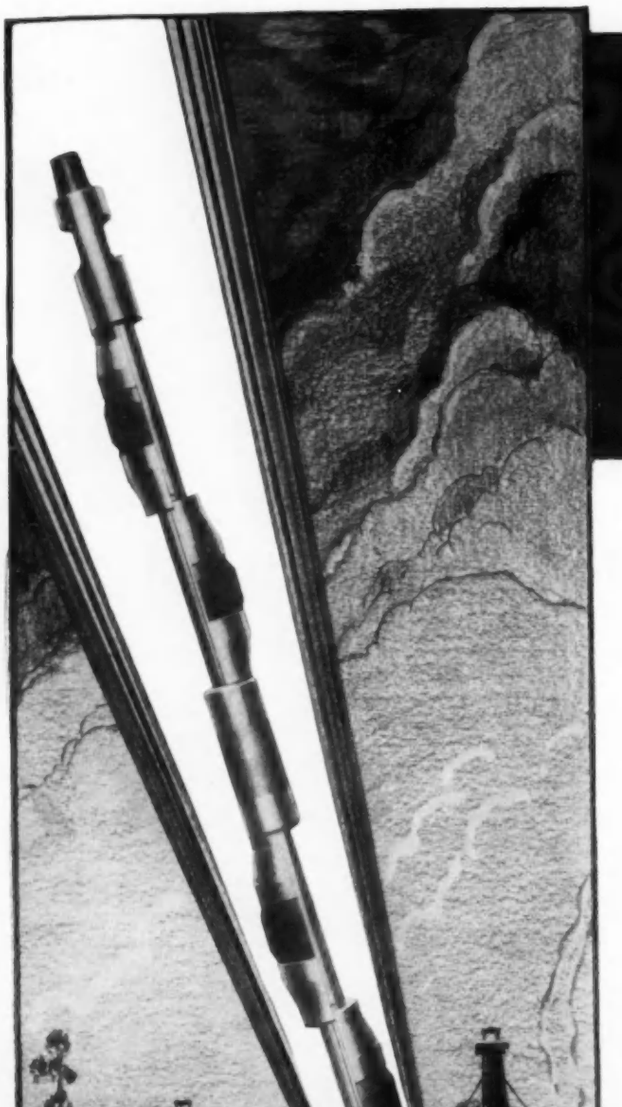

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THE OIL WEEKLY

DECEMBER 23, 1940

VOLUME 100 NUMBER 3

The Changing Panorama

Business Scene . . .

Industrial production of the United States for December will represent the high point of this year, it is believed. And the Federal Reserve Board's index is expected to show for 1941 more than a 10-percent gain, with output of new plants boosting that barometer up to 140 or higher by December, 1941, compared with 131 for November of this year. Average for the first half is estimated at 132.2 and for second half of 1941 it is estimated at 135.9.

Construction will be up no less than 14 percent in 1941, it is predicted, and employment will expand 3,000,000 or more by the end of that year, while 1,000,000 go into the army.

Higher wages, as well as increased employment, will swell industrial payrolls, which may break all records in 1942.

Government economists forecast that the coming year will bring an increase of around 7 percent in the 863 commodity prices used in the index of the Bureau of Labor Statistics.

Estimates on the United States Bureau of Labor commodity index for next year, made by well informed private authorities, indicate that the average for the first half of 1941 may be around 80.8 and for the second half 84.8.

The Incipient Boom . . .

The business boom of the next two years or more, produced by the national defense program, is foreseen as highly specialized and localized, with prosperity expected to center primarily in the industries and areas supplying munitions and war materials, while farmers try to get along without normal foreign markets.

The new, war-induced boom generally is recognized, moreover, as a fundamentally ominous prospect. For it will not be a normal, wealth-creating, lasting, or self-sustaining boom. On the contrary, it will be an artificial, economically fruitless, temporary boom, based probably in large measure on new public debt, settlement of which will be an unpleasant problem for the years ahead.

After the Boom? . . .

Oil operators and oil company executives, as well as other business men, even now must be concerned with the probabilities of 1943 and 1944, as well as the clearer prospects of 1941 and 1942.

Various business policies have been suggested for pursuance in the present circumstances. Among them is the avoidance of unnecessary plant construction, with expansion of production achieved if possible rather through increased efficiency or multiple shift operation. Initiative, ingenuity, and enterprise will be better rewarded than cautious conservatism, while the boom lasts, it is indicated. But the temporary nature of the opportunities must be recognized; and sound judgment calls for cutting down indebtedness while money is free and prices rising and, moreover, for the accumulation of cash reserves, through cautious dividend payments, in preparation for normal and less affluent times.

Opposed to this, however, is the feeling recently expressed by a representative of the United States Bureau of Mines, that refining capacity may have to be expanded, and the feeling on the part of many that a slowing down in oil operations may provide the administration argument for federal control on the ground that the oil industry is not showing the proper cooperative spirit.

Oil's Special Situation . . .

So all-embracing is the petroleum industry that it will feel much of the force of the national defense boom. It is expected that expansion of domestic consumption of oil, based in part on the defense program, will offset the loss of exports by spring, and that demand thereafter will set new all-time records. The United States Bureau of Mines estimates heavy gains in consumption in 1941 over 1940.

National defense authorities consider existing wells adequate for supplying crude-oil requirements. But they have suggested that the industry should increase facilities for making high-octane aviation gasoline, proceed with normal reconditioning and enlargement of ordinary refining equipment, expand storage facilities, and provide new gasoline pipe lines to serve strategic points.

The New Texas Commissioner

Texas oil men are observing with more than ordinary interest their new Railroad Commissioner Elect, Olin Culbertson, who takes office next month. Culbertson had the support of the majority of oil men in his rather hard-fought contest last summer, and has been hailed as a commissioner with oil experience and a man of unquestioned integrity.

Since the election, however, Commissioner Elect Culbertson has been reported as showing some other qualities which had not been noted during the election. The election seems to have increased the Commissioner Elect's opinion of the Commissioner Elect considerably! And an attitude which is not unfamiliar to the oil industry is seen in him by some—namely, a disposition toward the feeling that he is so honest, that maybe others might not be so entirely incorruptible. Secretary Ickes displays this feeling to a marked degree.

We believe, however, that Culbertson is going to make a good commissioner and we hope that he does not find it necessary to purchase a new hat.

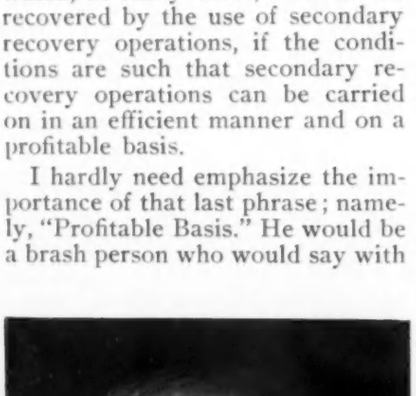
Need . . . Means of Royalty

AFTER all the oil which can be produced from a reservoir on a profitable basis by primary operations (natural flow, swabbing, gas lift and pumping) has been obtained there remains in the reservoir a very large amount of oil which, in many cases, can still be recovered by the use of secondary recovery operations, if the conditions are such that secondary recovery operations can be carried on in an efficient manner and on a profitable basis.

I hardly need emphasize the importance of that last phrase; namely, "Profitable Basis." He would be a brash person who would say with respect to any pool that the oil remaining therein after primary methods of recovery have become unprofitable cannot be substantially recovered. Some day, in the distant future, shafts may be sunk even to the mile and a quarter levels prevailing in the Oklahoma City field, and the oil bearing rock mined just as rock containing solid minerals is now mined, but that method of secondary recovery, at least with respect to such deep pools, will not be practical in our day.

The secondary recovery operations which have been found practical in various pools in Oklahoma —and by practical, I mean both feasible and profitable—are water flooding and repressuring by the injection of either gas or water.

Whether or not any, and if so which, of these secondary operations will be practical in a given pool, depends on a number of factors, including, among other important factors, the depth and characteristics of the producing formation; the cost of the wells, and whether or not a unit of sufficient size to render such operation both feasible and profitable can be obtained.



—Blankestoller Corp.

R. L. GORDON

Indian Territory Illuminating Oil Company's Chief Counsel

Advocates enactment of state legislature providing for unitization of royalty interests where majority of lease owners agree to unitize properties for secondary recovery purposes.

A speech before the Oklahoma Stripper Well Association

Two Year Study

For example, operators in the Wilcox sand area of the Oklahoma City field have for more than two years been studying the secondary recovery possibilities of that pool. About two years ago they formed an association for the purpose of employing engineers to devote their entire time to this study. For more than a year and a half, four engineers employed by this association have been devoting their entire time to the subject, and they have been assisted from time to time, and more or less continuously, by some half dozen additional engineers who are regularly employed by some of the interested operators.

After this long and thorough study, it is the consensus of these engineers:—

1. That repressuring by injection of gas is the only secondary recovery operation which would be practical for that pool;

2. That a gas repressuring operation cannot be efficiently and profitably carried on within the limits of any single lease within the pool, from which it follows,

3. That unitization of separately owned leases into a unit of suffi-

Unitizing Interests

cient size to justify the conduct of a gas repressuring operation is a prerequisite to the recovery of the vast amount of oil which will remain in that reservoir after primary recovery operations have become unprofitable.

Opinions differ as to the size of the unit required. Many advocate the consolidation of the entire pool, and that, perhaps, would be the ideal unit. Norman E. Maxwell (secondary recovery engineer of Indian Territory Illuminating Oil Company) is of the opinion that 640 acres would be the minimum unit within which a reasonably efficient and profitable operation could be carried on, and I am quite sure that the other engineers who have been working on this problem would concur, though many of them, doubtless, would consider that area insufficient.

The areas embraced within the separately owned leases in this pool vary from a maximum of 160 acres down to a minimum of only 2 or 3 acres, many of them being what we term "one-well" leases. Hence formation of even the minimum unit of 640 acres would require consolidation of at least four separately owned leases and, in some sectors of the pool, perhaps, as many as a dozen.

Small Royalty Holders

In some instances, one operator may have adjoining leases which embrace an aggregate of that much acreage, and in practically all situations two or three or, at most, a half dozen operators would own such leases. Hence there appears no insurmountable difficulty to unitization of the working interest into such a minimum unit, but unitization of the royalty interests in the same area is practically impossible on account of the large number of royalty owners under practically every lease; their widely scattered residences, and the exceedingly minute interests held by many of them.

For example, under one of our leases at Oklahoma City we have 411 royalty owners; under each of two others we have approximately 400, and, with the exception of Trosper Park under which the City of Oklahoma City is the only royalty owner, I surmise we haven't any lease with less than 25 or more royalty owners.

The several residences of these royalty owners are not only in all parts of the United States but also in Norway, France, Hungary, Algeria, Canada, England and Germany. The interests owned by some of them are exceedingly small. For example, we have a royalty owner under one of our leases who owns only slightly more than 1/1000 of 1% of the 1/8 royalty. It doesn't take much imagination to realize how impossible it would be to effect any character of an agreement with that royalty owner by correspondence. His interest in the entire project would not be sufficient to justify him in even reading the documents submitted for his signature.

We find ourselves then in this situation: Unless these royalty interests can be unitized by some method other than voluntary agreement, reasonably efficient and profitable secondary recovery operations cannot be carried on in that pool, and not only the operators, but also the royalty owners themselves (many of whom would be glad to cooperate), the state, and every tax-paying resident of the state will be deprived of the large benefits which would result from the recovery of the secondary oil remaining in that pool.

The only solution of this problem appears to be the enactment by the Legislature of an appropriate law authorizing some proper administrative agency of the state (undoubtedly the Corporation Commission in Oklahoma) after due notice to all interested parties and an open hearing to effect such a consolidation of royalty interests when it finds certain specified conditions justifying such consolidation to exist.

Duties of Commission

Roughly, the findings which the commission should be required to make, after notices and hearing, to support an order effecting any such unitization of royalty interests, should include the following:

1. That the owners of the working interest in the area with respect to which such unitization is sought, have agreed to the unitization of the working interest in such area; to the joint conduct of specified secondary recovery operations therein and to a plan for the future operations of the unitized area, the sharing of the operating costs and the allocation to the several properties embraced in the unit of the production from the unit.

2. That the area included in the proposed unit has reached the point where secondary recovery operations are necessary to avoid waste or to protect the correlative rights of the owners of the oil and gas reserves.

3. That the proposed secondary recovery operation is an appropriate one for the area embraced in the proposed unit; will not occasion substantial injury to the property adjoining the unit, and will probably result in substantial benefit to all parties interested in the oil and gas reserves under the unit.

The law should further provide

that if the commission makes an order effecting such unitization, it should then hold another hearing, of which due notice would be given to all parties interested, at which it would determine the proportions in which the royalty owners under the several separately owned tracts embraced in the unit would share in the 1/8 royalty in the future production from the unit.

Unitization Necessary

Unitization as here proposed may not be a prerequisite to secondary recovery operations in all pools in the state, but it is necessary in the prolific Wilcox pool at Oklahoma City and for other deep pools in that area, and there undoubtedly are many other pools in the state where similar conditions prevail. In fact, I think it may be properly said that, as a general rule, where repressuring is the only practical secondary recovery method available, the greater the area within which such operations can be carried on without regard to property lines within the area, the less will be the dissipation of the repressuring medium; the less will be the hazard of liability for damages to adjoining properties, the greater will be the opportunities for economies in operation, and the greater will be the ultimate net profits resulting from the secondary recovery operations.

All that I am here advocating is a unitization of royalty interests when the area to be unitized is held under lease by a single operator, or all the operators who own leases within the area have voluntarily agreed to a unitization of the working interests within the area. There are others, however, who, while agreeing that no such unitization should be effected unless substantially all the operators owning leases within the area consent thereto, feel that unanimous agreement on the part of the operators should not be required. This because the requirement for unanimous agreement on the part of operators furnishes too great an opportunity for "hold-ups." They point out that an operator who has only a relatively small interest in the proposed unit may not be content to receive only his fair and proportionate share of the benefits to accrue from the proposed operation and may take advantage of his power to block the proposed unitization to force others who will receive only proportionate, but a greater aggregate, benefit, to give him more than his fair proportionate share of the benefits in order to get him to consent to the proposed unitization. They suggest, therefore, that the law should authorize the commission to effect such a unitization of both the working and royalty interests when operators owning an arithmetic average of say 80% of the developed acreage, number of wells and current production within the proposed unit have consented to such unitization.

Would Help State

Roughly, based on the experience of recent years, the State of Oklahoma expends from $60,000,000 to $62,000,000 annually which must be raised by state taxation. For the 1938-1939 fiscal year the gross production tax, which is nearly all paid by the oil and gas industry, and the proration tax amounted to 17.46% of the total taxes raised and for the fiscal year 1939-1940 to 15.32% of the total taxes raised.

Based on various reports by the Tax Commission, it is estimated that the oil industry pays from 50% to 60% of the state income tax. Surveys made by the Mid-Continent Oil and Gas Association in the past indicate that the oil and gas industry also pays about 50% of the corporation license tax. In addition, the sales tax paid by the industry as the final consumer, the use tax, the motor vehicle license tax, motor vehicle excise tax, driver's licenses, title fees and inspection fees paid by the industry will amount to a very considerable figure.

It is the estimate of the Mid-Continent Association that the total state taxes paid by the oil and gas industry in Oklahoma, in addition to the direct taxes on the oil itself, have averaged around $6,000,000 to $7,000,000 over the past three or four years. This makes a total of around $15,000,000 in direct taxes paid annually by the oil industry in the state and constitutes approximately 27% of all state taxes. In addition to the state taxes, it is estimated that the various branches of the oil industry pay approximately from $5,000,000 to $5,500,000 annually in property taxes to local governments.

The cost of state and local governments will not decline along with and as the production of oil and gas in this state decline, and when we no longer have the oil and gas, the more than 27% of the total taxes raised will have to be raised from other sources.

I think, therefore, it must be obvious that the enactment of such a law as I here propose, that is a law which will authorize the Corporation Commission to unitize royalty interests in an area when such unitization is a prerequisite to the conduct of efficient and profitable secondary recovery operations therein and the owners of the working interests in such area have agreed to such unitization, is of vital interest not only to all operators who own interests in pools where such unitization is necessary, but also to all royalty owners who own interests in such pools and to every resident of this state who intends to remain a resident and taxpayer.

Would Be Valid

All questions with respect to the constitutional validity of such an act as is here proposed have been considered fully. Many oil lawyers have for years felt that the state had the necessary power. Some years ago Judge W. P. Z. German, general attorney of Skelly Oil Company, wrote a most interesting paper supporting that view. A paper to the same general effect has been written by Senator Clint Small of Amarillo, Texas. The principle is involved in the Oklahoma Well Spacing law, and I am quite sure from my discussion with Judge Veasey (retired legal counsel of Carter Oil Company) in connection with the draft of that law as well as from statements made by him in his paper on Well Spacing read before the Mineral Section of the American Bar Association some years ago, that he concurs in that view.

When, however, it was found that recovery of millions of barrels of the secondary oil in the Oklahoma City Wilcox pool would be impossible unless the state both had, and exercised, this power, the Secondary Recovery Association, on advice of its Legal Committee, employed R. M. Williams, of the firm of Miley, Hoffman, Williams, France and Johnson of Oklahoma City, to go fully into all of the legal questions involved. In pursuance of this employment, Williams has made a most exhaustive search for, and study of, all the authorities bearing on the subject and, based on this study, has advised the Association that, in his opinion, the state has the necessary power. The Legal Committee of the association has concurred in the opinion, and I certainly concur.

Federal Oil Control

OPPORTUNISM characterizes the latest attempt of the administration at Washington, in its move for federal oil control.

In his letter to Chairman Cole of the sub-committee of the House Interstate and Foreign Commerce Committee, which has under its wing the Ickes Federal Control Brainchild of the Roosevelt administration, urging action on proposed federal regulation of the oil industry, President Roosevelt was careful to refrain from the claim that federal regulation is needed because of any anticipated shortage of petroleum.

Instead of alleging that the federal oil-control bill was necessary because an adequate supply of petroleum for national defense is threatened, the President referred vaguely to "the vital need for petroleum in the national defense, its importance in commerce and industry, and the critical condition of Europe and Asia."

The reason the President refrained from claiming a possible shortage of petroleum, and therefore a necessity for federal regulation, is that he knows full well that the industry is prepared to meet any demand which may be put upon it. His letter is an obvious attempt to take advantage of a public feeling that unusual things must be done in our national defense program—just as it is also obvious that the administration for some time has been trying to build up a public feeling which would support an oil-control bill if and when the President felt it expedient to offer it.

That the oil industry is in fact over-trained for participation in war is well known to those who are familiar with its statistics. That it can instantly increase crude-oil production by at least 21 percent has been demonstrated, and THE OIL WEEKLY charges that the Army and the Navy have in their possession results of a survey these branches instigated some time ago, which show that the above figure is conservative. That the refining capacity is adequate for such needs as may arise can be proven quickly by a study of refining capacity and the probable needs as set out by the United States Bureau of Mines recently at the Interstate Oil Compact meeting in Tulsa. That the present supply of aviation gasoline is such as to be more than any immediate demand the government can impose is well known. That the capacity of alkylation plants, necessary to 100-octane gasoline, can be stepped up easily to meet increasing requirements also is well known. That the Army and Navy have been unable to make up their minds on the question of aviation gasoline requirements is no secret. That the recommendations of the Petroleum Advisory Board to the Council of National Defense are not given the weight by the administration which the experience and knowledge of the board would warrant, has been suspected for some time.

In other words, the attempt of the administration as expressed in the President's latest communication on oil control, is a political move based upon a hatred of the industry's leaders and the feeling on the part of at least some of the President's close advisors, that all natural resources are of right federal government property.

The oil industry must not be misled by any suggestion that the regulation proposed is a modification of previously proposed regulations and that government control would stop with the bill which President Roosevelt proposes.

The President shows his usual political astuteness when he infers laxness on the part of a state regulatory body in doing its duty. His advisors unquestionably have kept him well informed on the situation in Texas. One might even guess the names of some of his advisors. And the Texas Railroad Commission must today view the proposed big stick out of Washington with faces red with chagrin.

But while we feel that the Texas Railroad Commission has failed in its opportunities to carry out the spirit of the law giving it state regulatory power, and while Illinois has selfishly profited through no regulation there, THE OIL WEEKLY would prefer selfishness on the part of a few, and inefficiency on the part of others, which can be cured in legislative halls or at the polls, to the dictatorship sponsored by men like Harold Ickes.

The fact that the oil-control bill has been given another blood transfusion by the letter from President Roosevelt (information on which was kept secret for 20 days), does not mean that it will pass. The position of the industry is capable of such defense, the growing opposition to the leftist tendencies of the radical clique in Washington is becoming so alarming that if the industry, all parts of it, rally to its own defense at Washington, the bill will be killed either in committee or in the House.

But be not mistaken—the situation calls for real action.

DO NOT BE MISLED

SOME elements within the industry have been so disgusted by the desire of some states to take advantage of the proration umbrella of other states, and have been so wrought by the pigheadiness of the regulatory body of the nation's greatest oil producing state, that they might be willing to accept a "modified control" of the oil industry by the federal government, under the misguided idea that it will benefit them.

Be not misled.

Do not think that Harold Ickes, who is back of the proposed federal control, has a desire to help the individual operator. Do not think for one moment that a better price for the product of the oil producer is back of his thinking. Do not think for one second that if the regulation of the oil industry is placed in Ickes' hands, or that of Congress, the interests of any other than the ultimate consumer, and the political aspirations of those back of the bill will dictate its operation.

Do not forget that it is the federal government itself which is bringing the flood of foreign oil into the United States.

Do not forget that the proposed bill is but a toehold. That in the minds of its sponsors something deeper—which ultimately involves nationalization exists. Do not forget that one foreign country is right now toying with the idea of nationalization of oil—with a slick proposal to remove the objection of the land-owner—and that something of that sort could and probably would be an aftermath of federal control.

Do not forget the changing complexion of the United States Supreme Court.

In other words—do not forget that there exists no love on the part of the sponsors of the proposed federal oil legislation for those men, big or little, who are engaged in the business of producing oil.

Radio Telephone Answers Drilling Communication

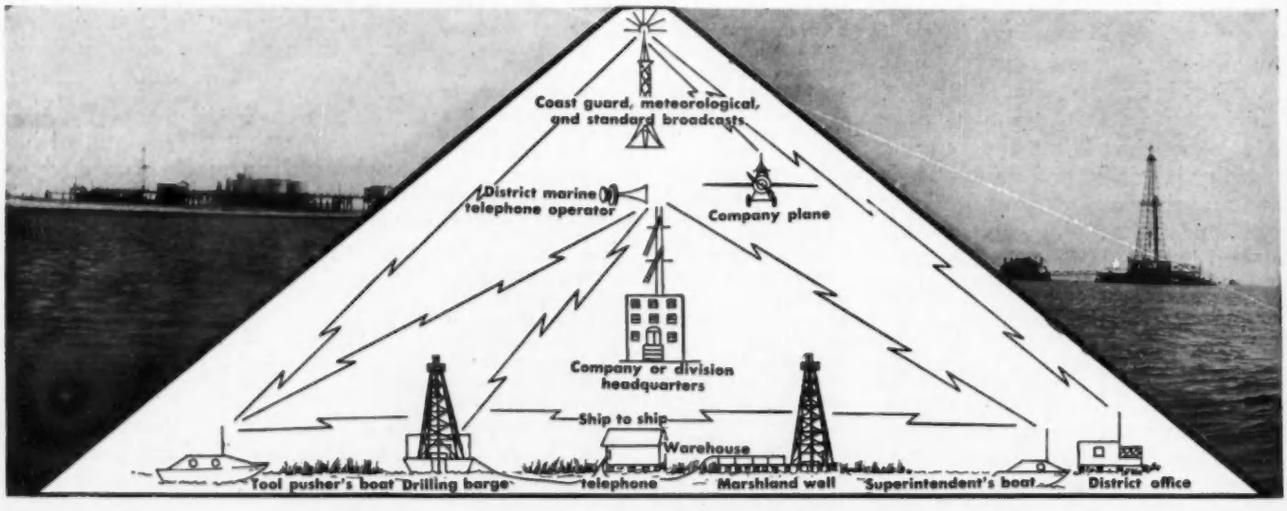
Inaccessible operations, increasingly common in coastal areas, are provided a direct, quick contact with headquarters by radio telephones.

THE marine radio telephone, latest implement in oil company communications, is in service with several major companies operating on the swampy coastal fringe and open waters of the Texas-Louisiana coast. The instrument, whose chief function is the expedition of marine and marshland drilling, is not new for merchant and pleasure craft, but has been applied recently to the needs of the oil industry.

The radio telephone is installed on both drilling barges and boats under license issued by the Federal Communications Commission. This license permits communication with any shore station connected to a commercial telephone system, and communication between marine stations not necessitating the use of a commercial land system. The first facility—communication with shore stations—gives any barge or boat so equipped direct contact with any land telephone.

With all the ease of completing a business call from an office desk, the operator on boat or drilling barge may call district, division, or company headquarters, supply houses, service companies, coast guard, or medical agencies. When used on an extensive scale, as in the current Galveston Bay program, the radio telephone may be the direct or indirect means of large savings in a type of drilling operation in which economies are hard to attain, and greatly increases the security of the drilling crew.

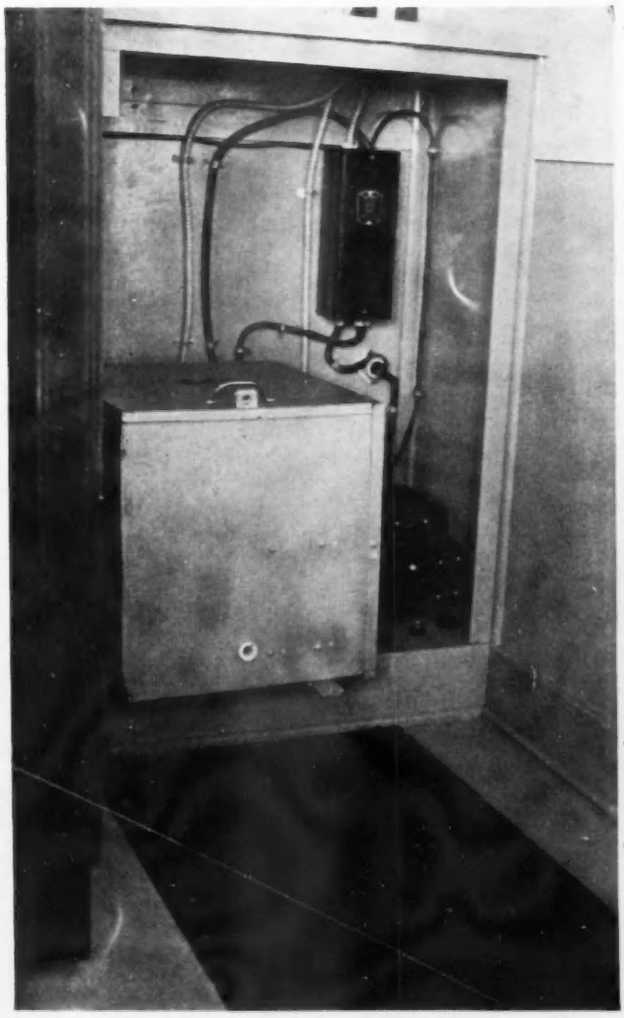
Current practice of most companies operating offshore is to lease a number of small boats in addition to those owned by the company, using a licensed pilot supplied by the lessor. Charges for this service vary from $10 to $50 per day. Use of the radio phone eliminates a number of boat trips daily, enabling fewer craft to service the operations. Superintendents and foremen issue instructions over the phone that formerly would require a boat trip wasting much valuable time. In a drilling emergency the radio phone may bring directions from the ultimate authority within a few minutes—directions, perhaps, that mean the difference between success and failure. All the several units in a marine campaign are thus tied together, with an easily traceable



Dangerous isolation of men and equipment, once an inescapable part of any marine drilling campaign, has been eliminated by use of every modern channel of communication. The wireless, the telephone, the airplane, boats, and more recently the commercial marine radio telephone, have tied together the scattered units in marsh land and offshore areas, with a notable increase in efficiency, safety and economy.

Marine Problem

A radio telephone installation in a speed boat, above, which the toolpusher or superintendent uses in his daily rounds of marine drilling operations provides direct, constant contact with drilling wells, warehouse, office and all land phones although he may be several hours travel to the location.



A small rotary converter changes 32-volt direct current to 115-volt alternating current to power the radio telephone. A power pack of storage batteries relieves the generator in daytime, being charged at night by the rig generator through the rectifier in the metal case.

Acoustical booths house the radio telephones on a drilling barge, effectively deadening rig noises. At right of booth is rectifier for charging storage batteries and rotary converter to change 32-volt direct current from rig generators to 115-volt alternating current.

saving in time and money. Expensive waiting by service companies—perforators, cement trucks, logging trucks, directional crews—is largely eliminated. Intangible but worthy of note is the improvement in employee morale when the feeling of isolation in event of storm or injury is removed.

Low Installation Cost

Against these advantages the price of installation is small. Sets operated from a 6- or 12-volt storage battery power-pack are priced at about $300, while larger sets operated on 110-volt AC are supplied, with rotary converter, for about $1000. Use of the equipment requires no specially trained personnel. Regulations permit the operation of this equipment by persons holding a third-class radio telephone operator's license. A superintendent, tool pusher, clerk, driller, or roughneck may obtain this license by passing a Commission examination requiring only elementary knowledge of radio laws and regulations, and familiarity with methods of operation. No qualification is necessary for those who use the instrument under the supervision of a licensed operator. All repairs must be made by persons holding a second-class or first-class license.

Calls are charged for by the commercial telephone company at rates comparable with those for the same distance on land. One-third of this toll is returned to the radio station. A call from a drilling barge in Galveston Bay to Houston costs $1.50 of which 50 cents is returned to the company or licensee.

The superintendent of a field in Quarentine Bay, Louisiana, called two warehouses several miles distant in search of a special sub to couple a gun perforator, then the company's district office at Harvey, Louisiana, where the sub was obtained, and sped to the location ahead of the perforating truck. The charges were $4.85, while several hours and heavy standby charges on the perforator truck were saved.

Systems Are Simple

Units in use are simple and compact. The set, consisting of transmitter, receiver, telephone handset, and built-in loud speaker, weighs from 35 to 65 pounds and occupies up to 1½ cubic feet of space. Three-frequency and four-frequency types are available, delivering up to 25 watts carrier power to the antenna. Frequencies range from 2300 to 2800 kilocycles, embracing established commercial shore stations, ship-to-ship communication assignments, and coast guard stations. A single control is provided for shifting both receiver and transmitter crystals simultaneously to any one of the frequency channels.

A call is initiated by selecting the frequency by a twist of the dial, lifting the handset, and, if the circuit is clear, identifying the sending station and asking the called station to "come in." In case of ship-to-shore calls, the Galveston or New Orleans marine operator's frequency is selected, the sending station is identified by its call letters and the name of the boat, and the marine telephone operator completes the call in ordinary long-distance manner.

Reception is controlled by a press-to-talk button on the handset, the operator throwing the switch each time he responds. By manipulation of another switch he may confine the conversation to the handset receiver or put it on the loudspeaker.

All calls and incoming conversations are audible to similarly equipped stations, making it necessary to listen continuously if a call is expected and there is no selective-ringing device on the radio. Where such is the case oil companies have established set times for routine communications with outpost stations. All orders and progress reports from the various fields, leases, and warehouses may be given over the radio phone. Drilling data, tank gauges, oil runs, time reports, requests for transfer of men and materials, and orders for the day are usually confined to early morning and evening, leaving intervening hours free for emergency communication.

Where the selective-calling feature is installed the operator at the shore station dials the number of the boat or barge called. With this system a loud bell rings only on the phone being called, making it unnecessary to maintain a constant vigil over the set. This feature is desirable on all installations and invaluable on drilling barges as, unlike a small boat, there is no one in constant proximity to the phone.

Electric rig power is utilized to run the radio phone on drilling barges. A 36-pound, 60-cycle AC rotary converter is installed to convert the 32-volt DC furnished by the rig generators to 115-volt AC. A storage battery power-pack is used to avoid running the rig generator in the daytime solely to power the radio telephone. These batteries are recharged by the generator at night.

Before radio phones could be installed on drilling barges it was necessary to devise a method of dampening the deafening rig noises. Humble Oil & Refining Company solved this problem by installation of acoustical booths to house the instrument. The booth, made of fire-board and wood and blocked off the floor to dampen vibration, is placed in the driller's office on the upper deck. This doorless phone booth is surprisingly effective in cutting rig noises to allow intelligible reception.

Employes Not Isolated

With the addition of the marine radio telephone, oil company communications in tideland areas are now all-embracing, leaving no unit nor group of employes in an isolated position at any time. The self-contained radio system instituted by The Texas Company in 1932 is still functioning with success, servicing many scattered fields without the benefit of direct connection to land telephone lines. The system used by Gulf Oil Corporation includes radio telephones and rig-to-rig and rig-to-warehouse magneto-type telephone circuits using a submarine cable of high strength and resistance to salt water submersion. All companies have conventional broadcast receivers with short wave bands in warehouses and camps, so that coast guard and meteorological bureau broadcasts may be closely followed.

The value of a rapid communication system in inaccessible areas with respect to medical service is obvious. Physicians and nurses can be obtained as quickly as an injured man can be brought from the field. In time of hurricane or flood the system is indispensable, as warnings are sent from headquarters with instructions to all local stations. These warnings have saved equipment, and probably lives, on several occasions, and checked dismantling operations as soon as the danger had passed. When necessary men are content to stay at their posts because of the direct contact with headquarters.

The kind assistance of H. Clark, Humble Oil & Refining Company, Houston, Texas, and J. O. Crowe, Gulf Oil Corporation, Buras, Louisiana, in preparation of this article is hereby acknowledged.

Attention to Details Required On High-Pressure Lines

OIL pipe lines operating under working pressures of from 650 to as high as 1000 pounds per square inch, and in sizes up to 10 inches normal diameter, have been designed carefully, laid and put through extensive and extended service tests with complete satisfaction. In the handling of fluids, such as crude petroleum and its derivatives, the line may be subjected to frequent pressure and temperature changes, but even in case of a line break or severe climatic conditions, such a change is in some degree cushioned by the quantity of oil being transported.

However, when carrying gas under pressures such as those met in oil pipe line operation, either mechanical failure or sudden temperature shift can subject the metal of the pipe wall to stresses far more severe than those encountered under like conditions when handling fluids. In a 15-mile oil pipe line, for instance, the pressure wave set up by a closed gate (no hydraulic shock or "water-hammer" condition intervening) requires a minimum of 65 to 80 seconds to travel from gate to pump in a line of Grade "B" pipe of standard composition. In the case of gas such a pressure increase would travel at the speed of sound within such a medium, or less than 15 seconds to traverse a 15-mile line.

Likewise, if an oil line were to break, such a condition would not affect the pipe temperature appreciably nor set up localized contraction stresses. But if a high-pressure gas line should break, expansion of the escaping gas will create a refrigerating condition which may drop the pipe temperature 100 degrees and result in practically instant formation of ice on the line.

In terrain similar to that of East Texas, a high-pressure gas line (using that term to cover lines transporting gas at pressures of 700 pounds per square inch or more) must be designed to withstand sudden pressure drops from maximum to atmospheric and temperature changes as great as 100 degrees F., in case of line break or

Turning alternate 2 x 10's on edge adds to loop length of pipes as it is strung and welded, assuring ample overbends for absorbing contraction under sudden cooling.

suddenly opened valve, and provision for and distribution of slack must be accurately carried out to guard against possibly pulling the line in two under the stresses generated by sudden contraction after a break. An oil line, under comparable conditions and with normal cover of not less than 18 inches of well compacted backfill, shows maximum seasonal variations amounting to 45 to 50 degrees F., with maximum 24-hour range—as checked by hourly readings of oil temperatures—of not to exceed four degrees F.

When selecting the pipe for one such high pressure gas line a maximum operating pressure of 1000 pounds per square inch was specified, although normal working pressures were expected to be regulated at 750 pounds. Using the formula (Barlow's) specified by A.P.I. standards

$$P = \frac{2St}{D}$$

and checking on the 4¾-inch seamless Grade "B" pipe used for laterals from the main line with $t = 0.148''$, $D = 4.5''$ and values of S as 14,000 and 18,000 lbs p.s.i., safe working pressures are found to be 920, 1052 and 1184 respectively; these being computed to provide a factor of safety of four. Checking this value against maximum possible gas pressure—that measured at the well from which high-pressure gas would be drawn—the second value of S gives an ultimate factor of safety of 1.53 and the largest allowable fibre stress a factor of 1.75; indicating complete protection even in case of pressures unattainable except under gross mishandling of well-head equipment.

Grade "B" seamless pipe thus conforms to the above specifications and so protects line and connections under maximum pressures, while possessing ample ductility to guard against equally serious contraction stresses.

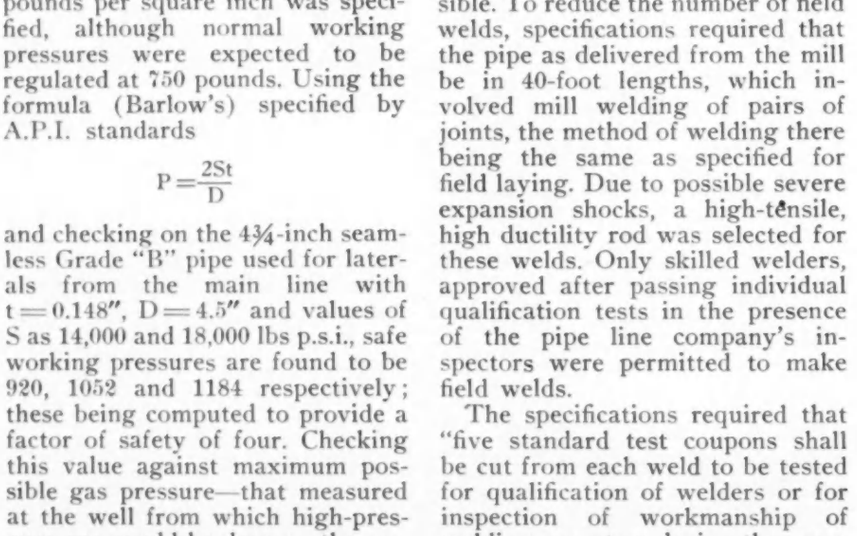
Welding was determined upon the method for fabricating the line, the lengths to be attached singly, or by "stovepiping," wherever possible. To reduce the number of field welds, specifications required that the pipe as delivered from the mill be in 40-foot lengths, which involved mill welding of pairs of joints, the method of welding there being the same as specified for field laying. Due to possible severe expansion shocks, a high-tensile, high ductility rod was selected for these welds. Only skilled welders, approved after passing individual qualification tests in the presence of the pipe line company's inspectors were permitted to make field welds.

The specifications required that "five standard test coupons shall be cut from each weld to be tested for qualification of welders or for inspection of workmanship of welding operators during the progress of construction on the line. One of these coupons will include the 'button' or finishing point of the weld. No two coupons will be taken from adjacent parts of the finished weld. Four of these coupons will be given customary tensile test in a portable bend and tensile testing machine. The fifth coupon will be given the customary 90° reverse bend test. Failure of more than one coupon in tensile test or failure of any coupon under a tensile stress of less than 30,000 pounds per square inch will condemn the tested weld as unsatisfactory. Opening at the root of the weld more than 1/16-inch in depth or more than one-half inch in length will condemn the tested weld as unsatisfactory. All qualification tests shall be position welds."

It was further specified that any welds designated for test were to be removed from the line, those proving satisfactory being replaced at the expense of the pipe line, those failing being at contractor's expense. Marking dies, stamped adjacent to finished welds, or welders' identifying numbers, stencilled on the pipe, provided checking on individual workmanship.

"Stovepiping" and bell-hole welding were carried out whenever possible, the only exceptions being when flooded terrain or multiple pipelines to be crossed necessitated the welding together of a string before being placed. In this connection it is interesting to note that such strings were not pulled, but actually pushed into place, the hitch being made at the back end of the string and the pipe, shielded with suitable bull-plug on the forward end, forced ahead through the ditch to the proper point. This method avoided any possibility of subjecting the welds to excessive tensile stress, at the same time providing better control of spotting the end of the string for welding to the already finished line.

Since a possible temperature range of 100 degrees F., was envisioned in the design of the line, slack of not less than eight inches to each 1000 feet of pipe was necessary. This was secured by the building of cribs or by turning supporting boards on edge while connecting up the line, allowing the pipe to sag sufficiently between supports to incorporate the required excess length. Such slack, built into the line while being welded, was prevented from over-



Alignment clamp and spacer in place as welder tacks junction preparatory to running completion bead. The swampy terrain covered makes wading necessary.

running the proper points during placing in the ditch by lowering the sags first, then carefully checking the overbends at the tops of the rises to insure adequate spacing between bottom of pipe and contour of the ditch.

Sweep bends were made whenever possible, slight changes in direction being incorporated through the "wrinkle bending" method when more abrupt changes were necessitated. All wrinkles were made to extend outwardly from the normal pipe wall to prevent any restriction in pipe cross-sectional area. All side bends were made so that the smooth outer wall of the pipe would fit snugly against the wall of the finished ditch; and sags were placed so that the smooth bottom wall of the pipe rested tightly against the firmly compacted bottom of the ditch.

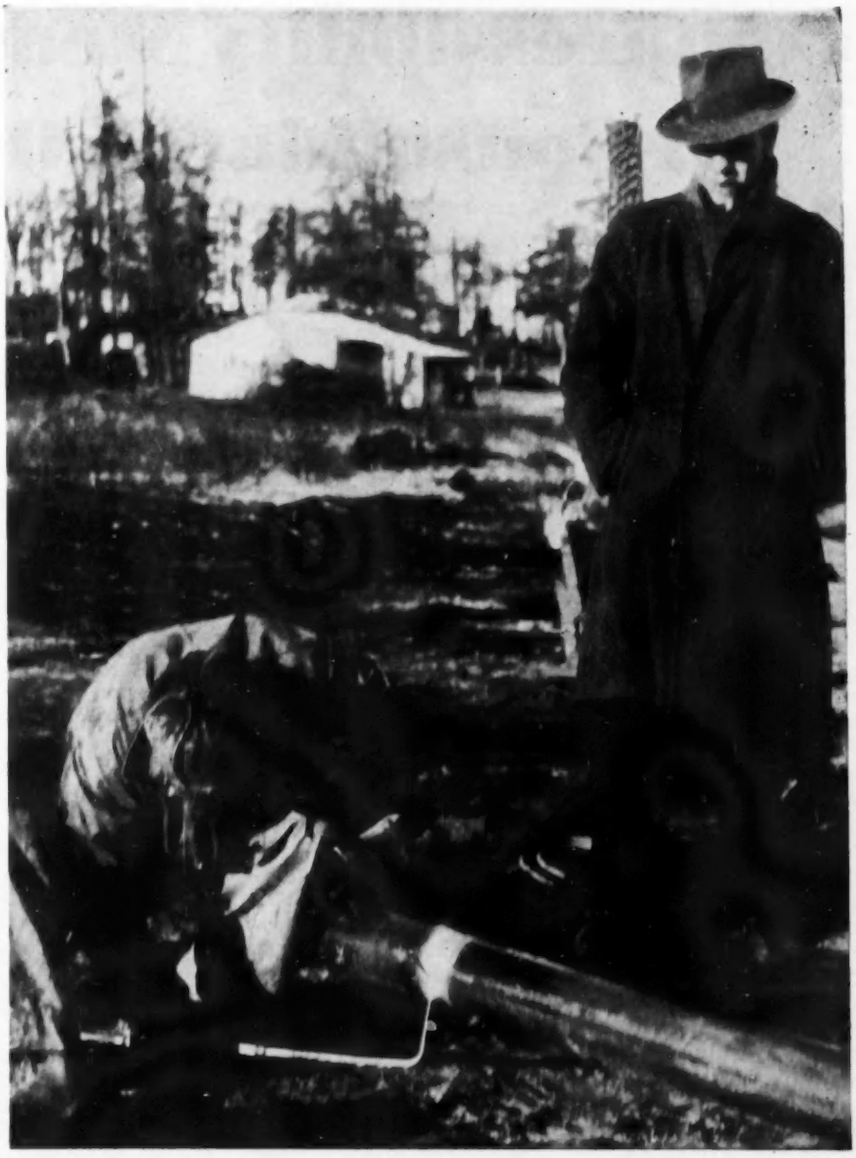
No mitre or angle welds were permitted in the construction of the line. Where removal of completed welds or field cutting of the line was required, such cutting was done with a pipe cutting and bevelling machine to maintain proper welding contours.

Cam-actuated alignment clamps were used throughout for lining the pipe for welding, the specified gap between the mill bevelled ends being maintained through the use of a gauge in the hands of the inspector who checked each weld as it was being run up. When using the alignment clamp, each added joint was sighted and welded in direct continuation of the line of pipe already fabricated, the clamp being used solely to preserve proper positioning of the pair of bevelled ends during the tacking operation. Any curving of line or wrinkle or other bending was done after welding had progressed past the point of bending sufficiently to avoid unduly stressing the weld.

Corrosion protection of the distribution branches from the main line was necessitated by their traversing portions of the East Texas field, crossing and paralleling pipe lines of various sizes at frequent intervals. To guard against corrosion on the 4½-inch distribution lines, each joint of pipe was thoroughly cleaned before being strung along the right-of-way and in addition, just before being welded in place, was dried and warmed with an oil-burning torch to facilitate placing and insure complete adherence of the heavy hand-applied coating.

The protective coating was applied to all but about three feet of pipe at each end of the double joint before field welding, to speed up the work of laying, the short section adjacent to the completed weld being coated after inspection of the work. Only natural or conductive cooling of the weld through flow of welding heat into the walls of the pipe was permitted—the metal cooling to a temperature of around 120 degrees F., before the final coating was applied around the welds.

When backfilling, each field weld was left exposed pending high-pressure or acceptance testing, the remainder of the ditch being filled to insure against shifting of the line as pressures were built up within it.



Each weld, made under close supervision and afterwards subject to rigid test, follows detailed plan.

Progressive testing of the line was carried out during construction, each section being blown clean with high pressure gas to insure absolute cleanliness—although each joint was thoroughly swabbed just prior to being positioned for welding into the line—and gas pressures above normal working values imposed on the line. For this work the gate valves required by law to protect railroad crossings were utilized whenever possible, these fittings serving to segregate the line into sections suitable for test.

The working of laying pipe on the line described was performed by Wood Engineering & Construction Company, under supervision of inspectors from the gas pipe line company.

Compressibility Measurements Of Consolidated Oil Sands

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A somewhat abstracted reprint from the U. S. Bureau of Mines' Report of Investigation 3540

SINCE 1918 some evidence of subsidence of the ground surface over a few producing oil fields has been observed, leading certain engineers and geologists to believe that the weight of the earth formations overlying oil-bearing reservoirs causes a compression and compaction (reduction in volume) of the reservoir sands and rocks as oil and gas are withdrawn from them. Many oil-producing rocks are sandstones in which the quartz grains are consolidated by natural cementing materials and will not "flow" to the well with the oil. On the other hand, the friable character of cores taken from some oil-bearing rocks and the quantity of sand that may accompany the oil to the well bore in many Gulf coast oil fields (if preventive measures are not taken) indicate that reservoir rocks in those areas may be unconsolidated or, at best, poorly consolidated sandstones. The quantity of sand brought to the surface of the ground with oil and gas, however, is a very small fraction of the total volume of the reservoir; for that reason, any analogy between subsidence of the earth formations overlying oil-producing reservoirs and subsidence in areas where underground mining operations are carried on and actual cavities are formed in the crust of the earth appears untenable.

As few experimental data on the compressibility of consolidated sedimentary rocks were available and such information seemed needed to determine the validity of certain opinions on reservoir performance, petroleum engineers of the Bureau of Mines investigated the compressibility of several sandstone cores from typical oil fields under conditions simulating those prevalent in the reservoirs. Among cores tested were those of Woodbine sandstone, Cretaceous age (the oil-bearing rock in the reservoir of the East Texas oil field); Bartlesville and Strawn sandstones, Pennsylvanian age; and Frio sandstone, Oligocene age.

This report is the result of the writers' study of subsidence in certain Texas Gulf coast oil fields and the experimental work done by them to determine the reduction in volume and the compressibility of consolidated oil-bearing sandstone cores under pressures up to 8000 pounds per square inch.

The tests of the sandstone cores indicate a small degree of compressibility, but it is not considered to be large enough to affect estimates of reservoir content and ultimate recovery, fluid-energy relations, or performance of petroleum reservoirs. It seems unlikely, also, from the results of the tests, that the surface subsidence noted in certain oil fields can be attributed to the compressibility of sandstone formations upon reduction of pressure in their pore spaces during oil production. The observed subsidence, or some part of it, may have resulted from dehydration and shrinkage of shale beds overlying and immediately underlying oil-bearing reservoir rocks. Such phenomena are within the realm of possibility, but no compressibility tests on shales were made part of this investigation.

Compressibility Evidence

Subsidence of the Goose Creek oil field, Harris County, Texas,[1] was observed first in 1918, about one year after the oil field was discovered. By 1926 the maximum measured subsidence was about three feet, and the affected area was about 2½ miles long and 1½ miles wide. Cracks were observed in the ground beneath houses and in streets surrounding the field, with the down-thrown sides of the cracks toward the oil field. Gaillard Peninsula, which was in the center of the oil field and was surrounded by San Jacinto Bay (an estuary of Galveston Bay), became completely submerged.

The subsurface formations in the Goose Creek field are geologically young rocks, beginning with the Beaumont clay (Recent and Pleistocene) at the surface and extending into the Fleming clays (Pliocene and Miocene) at a depth of about 5000 feet. Oil is found in sandstone lenses in the Fleming clays. No salt has been found in the field. According to Pratt and Johnson[2] the subsidence at Goose Creek is local and coincides with the area of oil extraction. Elevations of the surface of the ground taken at intervals in the Goose Creek field showed that subsidence continued with extraction of oil from the reservoir.

In 1926 the total oil, gas (at 1000 pounds per square inch), water, and sand extracted exceeded the equivalent volume of 100,000,000 barrels or about 560,000,000 cubic feet, and at that time subsidence could be made to account for only about 20 percent of the total subterranean voids created by the removal of these reservoir materials. Pratt and Johnson explained that as oil, gas, and water were extracted

[1] Pratt, Wallace E., and Johnson, Douglas W., Local Subsidence of the Goose Creek Oil Field: Jour. Geol., vol. 34, No. 7, part 1, October-November 1926, pp. 557-590.
[2] Pratt, Wallace E., and Johnson, Douglas W.

from the sandstone lenses the pressure therein was reduced and free water flowed from the surrounding clays and gumbos into the lenses. Core samples of clays penetrated during drilling in the Goose Creek field consisted of 30 percent water and 70 percent solid matter[3]. As drainage of clays causes them to become more compact, it was concluded that this compaction or shrinkage of clays and gumbos permitted the overlying formations to subside.

Subsidence over the Sour Lake field, Hardin County, Texas,[4] occurred in October, 1929, about 28 years after the field was discovered and development begun. The surface settlement continued over a 2-week period and affected a circular area approximately 1800 feet in diameter, which had a reported maximum depression of 40 feet near the center. The Sour Lake oil field lies on a piercement-type salt dome, and the oil occurs between the depths of 800 and 1200 feet in and below a thin cap rock that overlies the salt plug. Apparently, as the oil was removed from the underlying formations it was replaced by water from fresh-water sands or by meteoric waters percolating into the oil-producing sands from the surface. Salt from the plug was dissolved by the fresh water and was removed through the oil wells as brine The solution of part of the buried salt plug formed a cavity that undermined the cap rock, rendering it incapable of supporting the overburden; the natural result was a slumping or subsidence of the overlying beds. A calculation showed that the salt dissolved in the brine pumped from the wells would more than fill the depression formed at the surface as a result of subsidence.

In discussing the origin of artesian pressure in the Dakota artesian basin, which extends over eastern and western South Dakota and parts of Nebraska, North Dakota and adjoining states, Russell[5] refuted the generally accepted explanation that artesian pressures are caused by freely circulating waters that constitute a hydrostatic column reaching from the outcrop to a given depth and suggested that the artesian pressure was due to subsidence. The height of the column at a given depth equals the difference in the elevations of the outcrop and the given depth. Russell contended that the Dakota sandstones were too lenticular to permit migration of water for long distances; therefore, the artesian pressure had to be explained otherwise. He concluded that the overburden must have compressed the sandstone and caused subsidence of the surface. It was estimated that the total volume of 20 billion barrels (1 barrel = 42 gallons) of water that was produced in 15 years would make a uniform layer 2 inches thick over the artesian area of eastern South Dakota. Russell conjectured therefore that this area must have subsided 2 inches.

Meinzer[6] cited evidence that artesian water, especially in strata of sand or soft sandstone, supports part of the load of the overlying rock and that the aquifers are compressed when the hydrostatic pressure is decreased and expanded when it is increased. Although this evidence indicated only a moderate amount of contraction and expansion, the changes in volume of some artesian basins were more than could be attributed to the elasticity of water and were large enough to affect radically the conclusions in regard to the recharge, movement, and discharge of the water in artesian aquifers. In reviewing the literature Meinzer[7] found this theory had been suggested in 1890 by Hay[8] and in 1906 by Gregory[9]. He also found that the principle of compressibility of porous rocks was implied by Veatch[10] in 1906 in a discussion of the effects on the head of artesian water wells produced by ocean tides, the rise of rivers and lakes, the passing of trains, and the erection and burning of buildings.

Van Tuyl and Beckstrom[11] described several experiments in which various types of unconsolidated sedimentary materials were arranged in a steel cylinder and pressures up to 3375 pounds per square inch were applied by a piston. The voids of the sedimentary materials were filled with specified mixtures of oil and water. The fluids displaced by the piston were measured to determine the degree of compressibility or compaction.

In one test 1000 cc. of unconsolidated, dry sand of medium texture was found to be capable of absorbing 426 cc. of fluid, indicating a porosity of 42.6 percent. When pressure of 3375 pounds per square inch was applied 208 cc. of fluid was displaced, indicating that the total volume of the saturated sand was reduced 20.8 percent to 792 cc. and the total volume of the pore space was reduced from 42.6 to 27.5 percent. From a study of these data Van Tuyl and Beckstrom concluded that the pressures imposed by the overburden or by diastrophism may be important factors in causing the migration of oil into reservoir rocks.

The results of similar experiments performed by Terzaghi[12] on a sample of compacted, unconsolidated sand showed that the porosity of the sand was decreased from 40 to 30 percent when a pressure of 1250 pounds per square inch was applied.

Botset and Reed[13] measured the compressibility of unconsolidated sand (30-40 mesh) at pressures up to 3000 pounds per square inch. Great care was exercised in selecting a steel container with enough rigidity to preclude the possibility of any volume change in the apparatus that might contribute to the apparent compressibility of the sand. The results of these experiments indicated a decrease of 0.70 in the percentage of porosity of the unconsolidated sand. If an original porosity of 37 percent were assumed, displacement of an equivalent volume of fluid would be $\frac{0.70}{37.0} = 1.9$ percent of the fluid content of the sand. These experimenters concluded that "Since the sand used in the experiment was unconsolidated, the compressibility of even a slightly consolidated sand should be much less, and it is apparent that compressibility of a sand is, in general a minor factor in oil production."

In 1934 J. S. Hudnall[14] proffered an explanation of the apparent lag in water encroachment in the

[3] Pratt, Wallace E., Some Questions on the Cause of the Subsidence of the Surface in the Goose Creek Field Texas: Bull. Am. Assoc. Petrol. Geol., vol. 11, No. 8, August 1927, pp. 887-889.

[4] The Lamp, A Disappearing Oil Field: December 1929, pp. 10-12.

[5] Russell, W. L., The Origin of Artesian Pressure: Econ. Geol., vol. 23, No. 2, March-April 1928, pp. 132-157.

[6] Meinzer, O. E., Compressibility and Elasticity of Artesian Aquifers: Econ. Geol., vol. 23, No. 3, May 1928, pp. 263-291.

[7] Meinzer, O. E., work cited in footnote 9.

[8] Hay, Robert, Artesian Wells in Kansas and Causes of Their Flow: Am. Geol., vol. 5, 1890, pp. 296-301.

[9] Gregory, J. W., The Dead Heart of Australia: John Murray, London, 1906, pp. 288-289.

[10] Veatch, A. C., Fluctuations of the Water Level in Wells with Special Reference to Long Island, N. Y.: Geol. Survey Water Supply Paper 155, 1906, pp. 62, 63, 65-69, 74-75.

[11] Van Tuyl, F. M., and Beckstrom, R. C., The Effect of Pressure on the Migration and Accumulation of Petroleum: Bull. Am. Assoc. Petrol. Geol., vol. 10, No. 10, October 1926, pp. 917-930.

[12] Terzaghi, Charles, Principles of Soil Mechanics: Eng. News-Record, vol. 95, 1925, pp. 987-996.

[13] Botset, H. G., and Reed, D. W., Experiment on Compressibility of Sand: Bull. Am. Assoc. Petrol. Geol., vol. 19, No. 7, July 1935, pp. 1053-1060.

[14] Hudnall, J. S., Unpublished paper read before the Am. Assoc. Petrol. Geol. annual meeting, Dallas, Tex., March 1934; cited by courtesy of the author.

Mexia and East Texas oil fields as oil and gas were withdrawn. He conjectured that as oil and gas are withdrawn from a reservoir the potential production or capacity of the wells is reduced because the accompanying reduction in hydrostatic or reservoir pressure causes compaction of the reservoir rocks, which in turn reduces the porosity and permeability of the rocks. In other words, Hudnall considered that the voids in the rocks become smaller when the internal or hydrostatic pressure, resisting the downward pressure exerted by the weight of the overburden, is decreased. This phenomenon of compressibility or compaction was illustrated by him by a "porosity vs. compaction" curve constructed from published data on two consolidated rocks (granite and Ohio standstone) and one unconsolidated sand. By interpolation the compaction or compressibility of Woodbine sand (oil-bearing rock in the East Texas oil field) was estimated to be 2.0 percent per 1000 pounds increase in pressure.

In a discussion of Hudnall's paper, Lewis [15] refuted this estimated compressibility of sandstones. He pointed out that compressibility or compaction tests of unconsolidated sands have no quantitative value because the results depend on the method of packing the sand in the apparatus; furthermore, unconsolidated sands become crushed or fractured under pressure, and the fine edges thus broken off lodge in the interstices or voids as dust.

C. E. Reistle, Jr., while chairman of the East Texas Engineering Association, conducted some experiments on cores of Woodbine sandstone from the East Texas oil field to determine the magnitude of reduction in porosity of a reservoir sandstone caused by lowering of the hydrostatic or reservoir pressure. The results of his work have not been published, but he has made the following facts available to the writers for use in this report. In these tests thin lead caps with small pipe connections near their centers were cemented to the ends of the core. After the lead caps had been cemented the entire surface of the core was coated with lacquer, applied in thin coats. The sealed core then was evacuated, saturated with flushing oil, and placed in a pressure chamber from which a capillary tube extended vertically through a stuffing box. Hydrostatic pressure was applied to the outside of the lacquer-sealed core, and the flushing oil inside the core was maintained at atmospheric pressure. The volume of oil expelled from the core through the capillary tube when hydrostatic pressure was applied to the outside of the core was considered to be a measure of the reduction in porosity due to external pressure. It was assumed that the external hydrostatic pressure was resisted by the compressive stress in the sand grains. The results of the tests showed that, for pressures between 0 and 4000 pounds per square inch, the reduction in pore space was between 0.050 and 0.056 percent per 100 pounds per square inch increase in pressure.

From the foregoing citations of some previous experiments to measure the compressibility of sedimentary rocks it is seen that most of the tests were performed on unconsolidated sands. The work of Reistle offers virtually the only information on the compressibility of consolidated, oil-bearing sedimentary rocks.

[15] Lewis, J. O., "Rock Pressure": Petrol. Eng., May 1934, pp. 40-44.
[16] Adams, S. H., and Williamson, E. D., The Compressibility of Minerals and Rocks at High Pressures: Carnegie Inst. Geophys. Laboratory, Paper 484; reprinted from Jour. Franklin Inst., vol. 195, April 1923, pp. 475-529.
[17] 1 megabar = 1.0197 kilograms per square centimeter = 0.9869 atmosphere = 14.504 pounds per square inch (approximately).
[18] Adams, L. H., and Williamson, E. D., Work cited in footnote [16].

Extensive laboratory research has been carried on by various experimenters to measure the compressibility of rocks and minerals at high pressures such as exist at relatively great depths below the surface of the earth. That information is of use in connection with problems of geophysics, including tidal deformation of the earth, elastic yielding of the earth's crust as a result of loads such as mountain masses or icesheets, propagation of earthquake waves, and effect of pressure on the stability of minerals. Adams and Williamson, Carnegie Institution, Washington, have presented the results [16] of measurements of the decrease in volume of a number of rocks and minerals at pressures up to 12,000 megabars [17] (174,000 pounds per square inch, approximately), corresponding to a depth of about 40 kilometers (131,233 feet). From the measured decrease in volume the compressibility was calculated directly, and from the compressibility approximate values of the rigidity of the rocks were computed.

Adams and Williamson defined compressibility as

$$\beta = -1/V_o \frac{dV}{dP}$$

Where:

$-dV$ = diminution in volume for a given increment of pressure dP;

V_o = volume at some standard pressure and temperature. A compressibility of 1×10^{-6} means that the volume of the substance in question is reduced by one millionth of its value (at standard pressure) for each magabar increase of pressure.

The compressibility,[18] for each megabar increase in pressure for the mineral quartz is:

	At 2000 megabars	At 551 megabars
Quartz (SiO_2)	0.000,002,625	0.000,002,681

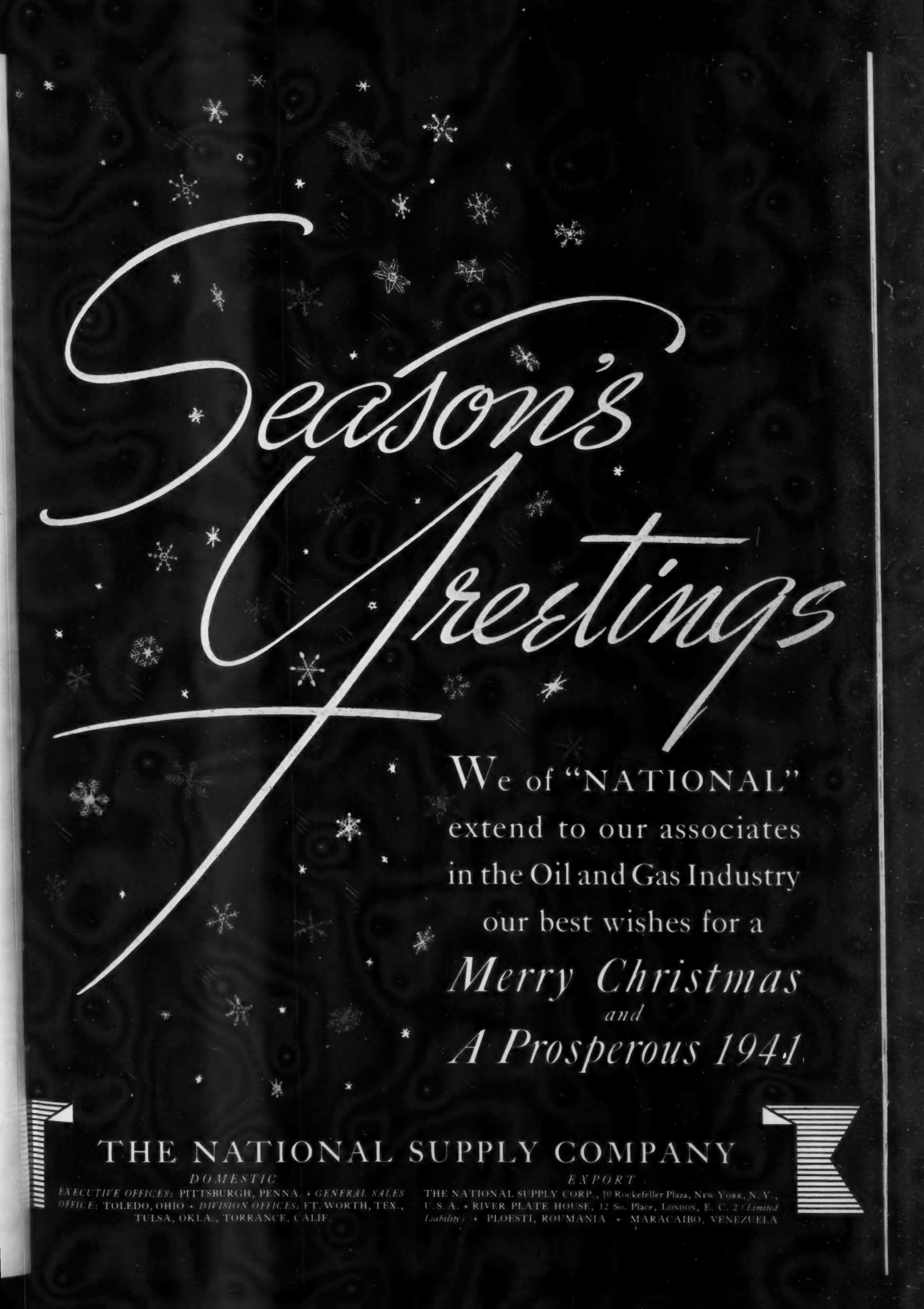
2000 megabars = 29,000 pounds per square inch (approximately).
551 megabars = 8,000 pounds per square inch (approximately).

This value of the compressibility of quartz was computed from data presented by Adams and Williamson, who subjected solid minerals to hydrostatic pressure in a thick-walled steel cylinder. Some rocks tested by Adams and Williamson were enclosed in tin toothpaste tubes, which suggested the procedure used by the writers in this investigation.

Significance of Compressibility Data on Sedimentary Rocks

The theory of subsidence of the overburden overlying a fluid-saturated sandstone reservoir is based upon the premise that the weight of the overburden, distributed as a uniform vertical load on the reservoir rock, is resisted by the hydrostatic pressure on the fluid in the reservoir rocks. The theory does not consider the possibilities of arching effects or inclined beds transmitting their loads in directions other than vertical. As all accumulations of petroleum and natural gas in underground reservoirs are caused by the entrapment of fluids (oil, gas, and water) against or beneath impervious starta, such as shale, it is reasonable to believe that the hydrostatic pressure of the fluids in the reservoir system expands the fluid-saturated reservoir rocks and tends to lift the overburden.

Consolidated sandstone rocks have a specific gravity of 2.20 to 2.50; hence, any overburden consisting largely of sandstone may be assumed to exert a downward pressure of approximately one pound per square inch per foot of depth. The normal hydrostatic pressure in a fluid reservoir equals 0.434 pound per square inch per foot of depth. The load of one pound per square inch imposed by each layer of overburden one foot thick is resisted by a hydrostatic



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pressure of 0.434 pound per square inch per foot of depth below the outcrop of the water-filled porous stratum.

According to this theory, the weight of the formations overlying the East Texas oil field (average depth, 3600 feet) would be expected to exert a downward pressure of 3600 pounds per square inch. As the original reservoir pressure was approximately 1600 pounds per square inch, the differential pressure originally compressing the reservoir rocks was 3600 minus 1600 or 2000 pounds per square inch. When the reservoir pressure was reduced to 1100 pounds per square inch as a result of the withdrawal of oil, gas, and water the differential pressure compressing the reservoir rocks was 3600 minus 1100 or 2500 pounds per square inch, or 500 pounds per square inch more than the original differential pressure.

All matter is compressible to some degree, although the compressibility of some substances is so small that it usually is ignored. Published results of measurements of the compressibility of minerals and igneous rocks show extremely low coefficients of compressibility. For example, at a pressure of 8000 pounds per square inch, the coefficient [19] of compressibility of quartz is 0.000,002,681 per megabar.

Most sandstones are composed largely of quartz or silica, hence the compressibility of sandstone might be expected to approximate the compressibility of its major component mineral. This hypothesis, however, has been challenged by some engineers because the minerals comprising a sandstone exist as small grains tightly cemented by calcareous, siliceous, and ferruginous material; and it is conceivable that the compression of a sandstone rock might rearrange, deform, or fracture the individual sand grains comprising a sandstone and even embed them more deeply in the matrix of cementing material.

Because knowledge of the degree of compressi-

[19] Adams, L. H., and Williamson, E. D., Works cited in footnote [16].

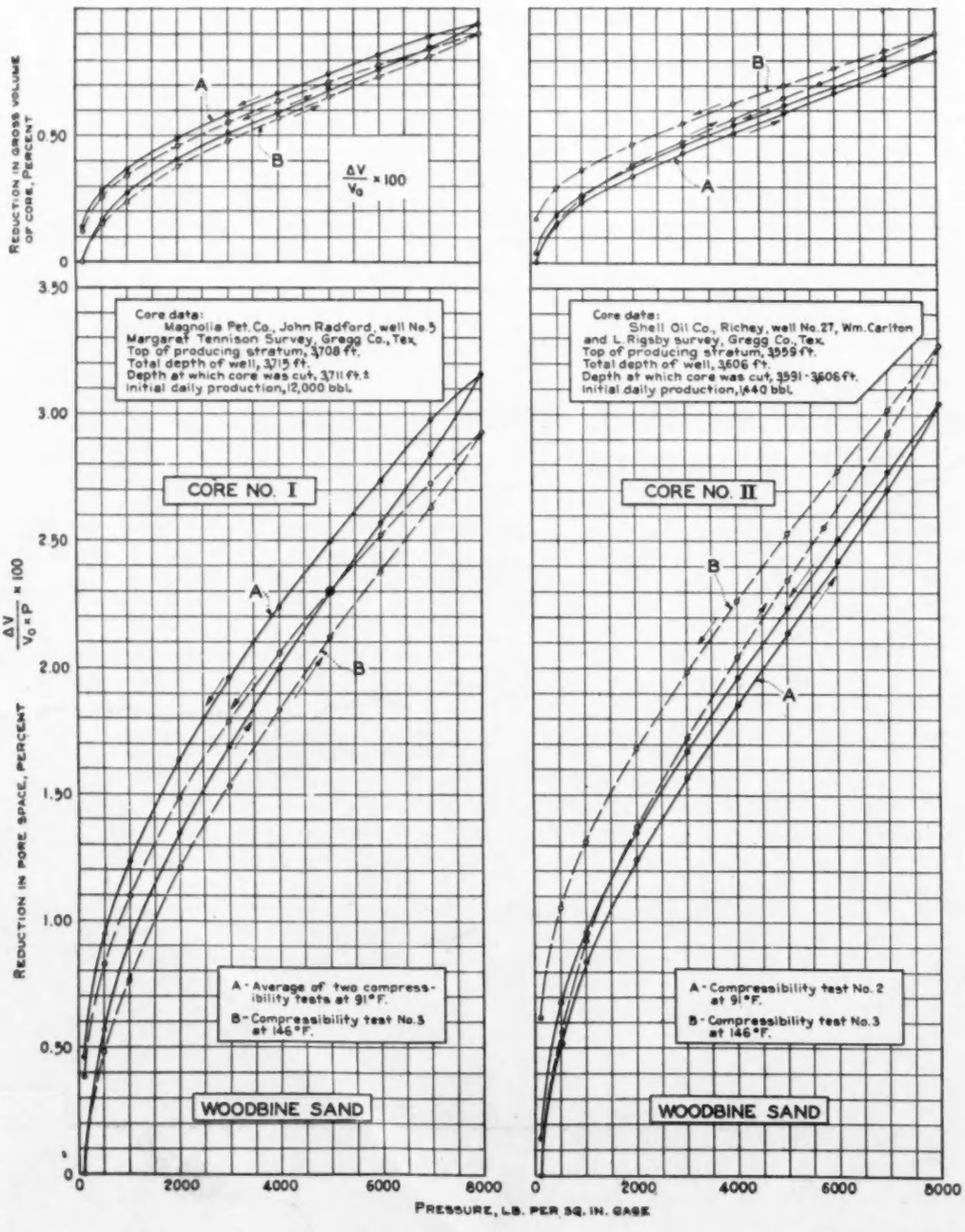

REDUCTION IN GROSS VOLUME OF CORE, PERCENT
$\frac{\Delta V}{V_0} \times 100$
A
B
Core data:
Magnolia Pet. Co., John Radford, well No. 5
Margaret Tennison Survey, Gregg Co., Tex.
Top of producing stratum, 3708 ft.
Total depth of well, 3715 ft.
Depth at which core was cut, 3711 ft.±
Initial daily production, 12,000 bbl.
CORE NO. I
$\frac{\Delta V}{V_0 \times P} \times 100$
REDUCTION IN PORE SPACE, PERCENT
A - Average of two compressibility tests at 91° F.
B - Compressibility test No. 3 at 146° F.
WOODBINE SAND
Core data:
Shell Oil Co., Richey, well No. 27, Wm. Carlton and L. Rigsby survey, Gregg Co., Tex.
Top of producing stratum, 3559 ft.
Total depth of well, 3606 ft.
Depth at which core was cut, 3591 - 3606 ft.
Initial daily production, 1440 bbl.
CORE NO. II
A - Compressibility test No. 2 at 91° F.
B - Compressibility test No. 3 at 146° F.
WOODBINE SAND
PRESSURE, LB. PER SQ. IN. GAGE

FIGURE 1
Pressure-Volume Relations for Woodbine Sandstone

Merry Christmas and Happy N. Y.

from

THE LARKINS

bility, and reduction in volume resulting from the compression, of sedimentary rocks is important to petroleum technologists, a preliminary investigation was made of oil fields over which the surface had subsided. Goose Creek and Sour Lake furnish the classic examples of subsidence over oil fields, but neither has been attributed to any alteration of the reservoir rocks from which the oil was produced. In each field the subsidence was important to the oil producer because of the physical damage it caused, but it shed no light on the theory advanced by some engineers and geologists that the withdrawal of oil, gas, and water from an oil- or gas-bearing reservoir may cause compression, compaction, or readjustment of sand grains.

As published information on the behavior of consolidated sedimentary rocks under pressure was found to be meager, the Bureau of Mines initiated studies and investigated the compressibility of some of the sedimentary rocks commonly found in petroleum reservoirs to determine whether or not subsidence of the surface of the ground, as in the Goose Creek field, could be caused by a reduction in volume of the reservoir rocks as a result of the extraction of oil, gas, and water. The investigation was undertaken by the Bureau of Mines as part of a coordinated study, the thesis of which is "reservoir performance."

Discussion of Results

Successful results were obtained from 6 of the 16 cores tested; 10 cores could not be tested successfully because they were too poorly consolidated or too dense to allow saturation with water, or because they contained sharp, angular grains that punctured or ruptured the metal jackets in which they were enclosed.

The reduction in volume or cubical compression of the cores tested, as shown by several tests, ranged from 0.616 to 1.084 percent between pressures of 100 and 8000 pounds per square inch. The reduction in volume of the pore space between the same pressures ranged from 2.82 to 3.608 percent. The compressi-

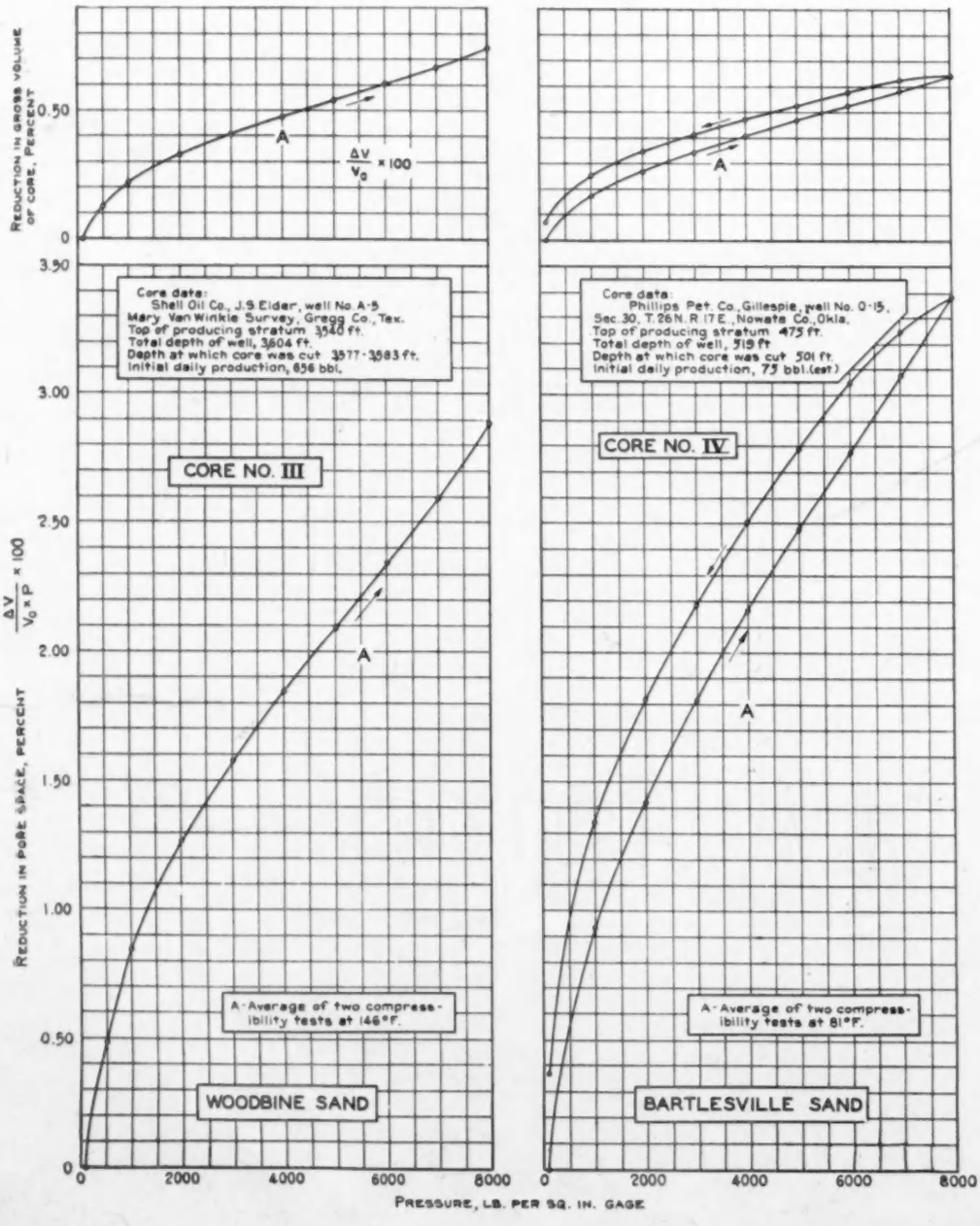
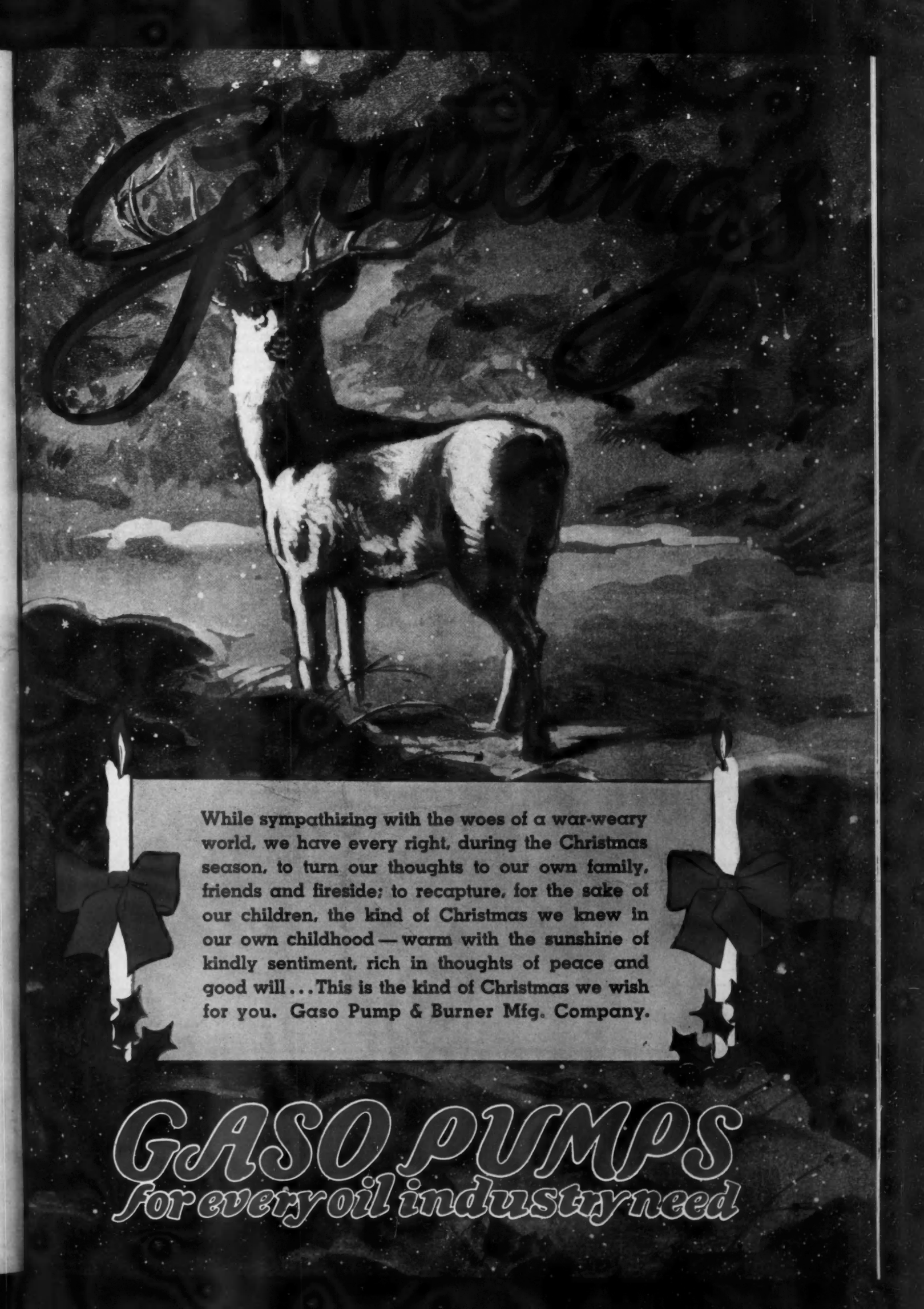

REDUCTION IN GROSS VOLUME OF CORE, PERCENT
$\frac{\Delta V}{V_0} \times 100$
A
Core data:
Shell Oil Co., J.S. Elder, well No. A-5
Mary Van Winkle Survey, Gregg Co., Tex.
Top of producing stratum 3540 ft.
Total depth of well, 3604 ft.
Depth at which core was cut 3577-3583 ft.
Initial daily production, 656 bbl.
CORE NO. III
$\frac{\Delta V}{V_0 \times P} \times 100$
REDUCTION IN PORE SPACE, PERCENT
A-Average of two compressibility tests at 146°F.
WOODBINE SAND
Core data:
Phillips Pet. Co., Gillespie, well No. 0-15,
Sec. 30, T. 26 N., R. 17 E., Nowata Co., Okla.
Top of producing stratum 475 ft.
Total depth of well, 519 ft.
Depth at which core was cut 501 ft.
Initial daily production, 75 bbl. (est.)
CORE NO. IV
A-Average of two compressibility tests at 81°F.
BARTLESVILLE SAND
PRESSURE, LB. PER SQ. IN. GAGE

FIGURE 2

Pressure-Volume Relations for Woodbine and Bartlesville Sandstones



While sympathizing with the woes of a war-weary world, we have every right, during the Christmas season, to turn our thoughts to our own family, friends and fireside; to recapture, for the sake of our children, the kind of Christmas we knew in our own childhood — warm with the sunshine of kindly sentiment, rich in thoughts of peace and good will . . . This is the kind of Christmas we wish for you. Gaso Pump & Burner Mfg. Company.

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bility of these rocks, between 100 and 8000 pounds per square inch, computed by the equation

$$= \frac{-1}{\beta V_o} \frac{dV}{dP},$$

ranged from 0.000,011,32 to 0.000,019,89 per megabar or about five or six times the compressibility of quartz, which Adams and Williamson[20] found to be 0.000,002,68 at a pressure of 8000 pounds per square inch (551 megabars).

Compressibility of the rocks computed for 5000 to 8000 pounds per square inch pressure or for that part of the pressure-volume curves in which the slope is regular ranged from 0.000,008,14 to 0.000,-015,3 per megabar.

The pressure-volume relations for cores I, II, III, and IV, V, and VI are shown graphically in Figures 1, 2, and 3. Curves for each core have been drawn to illustrate the changes in gross volume and pore space caused by differential pressures between 100 and 8000 pounds per square inch. The greatest change per unit increase in pressure occurred between 100 and 2000 pounds per square inch pressure. Between 2000 and 8000 pounds per square inch pressure the curves approach straight lines. Slight upward deviations in the curves for cores I, II, III, and VI between 7000 and 8000 pounds per square inch pressure were due to lack of precision in regulating the hydrostatic pressure by means of a Bourdon gage instead of a dead-weight tester, as was done at 100 to 6000 pounds per square inch pressure.

It is difficult to assert what conception of compressibility is correct for consolidated, sedimentary rocks, which are composed largely of quartz grains cemented with calcareous, siliceous, and ferruginous material. The effect measured in this investigation may be compressibility or compaction as the reduc-

[20] Adams, L. H., and Williamson, E. D., Work cited in footnote [16].

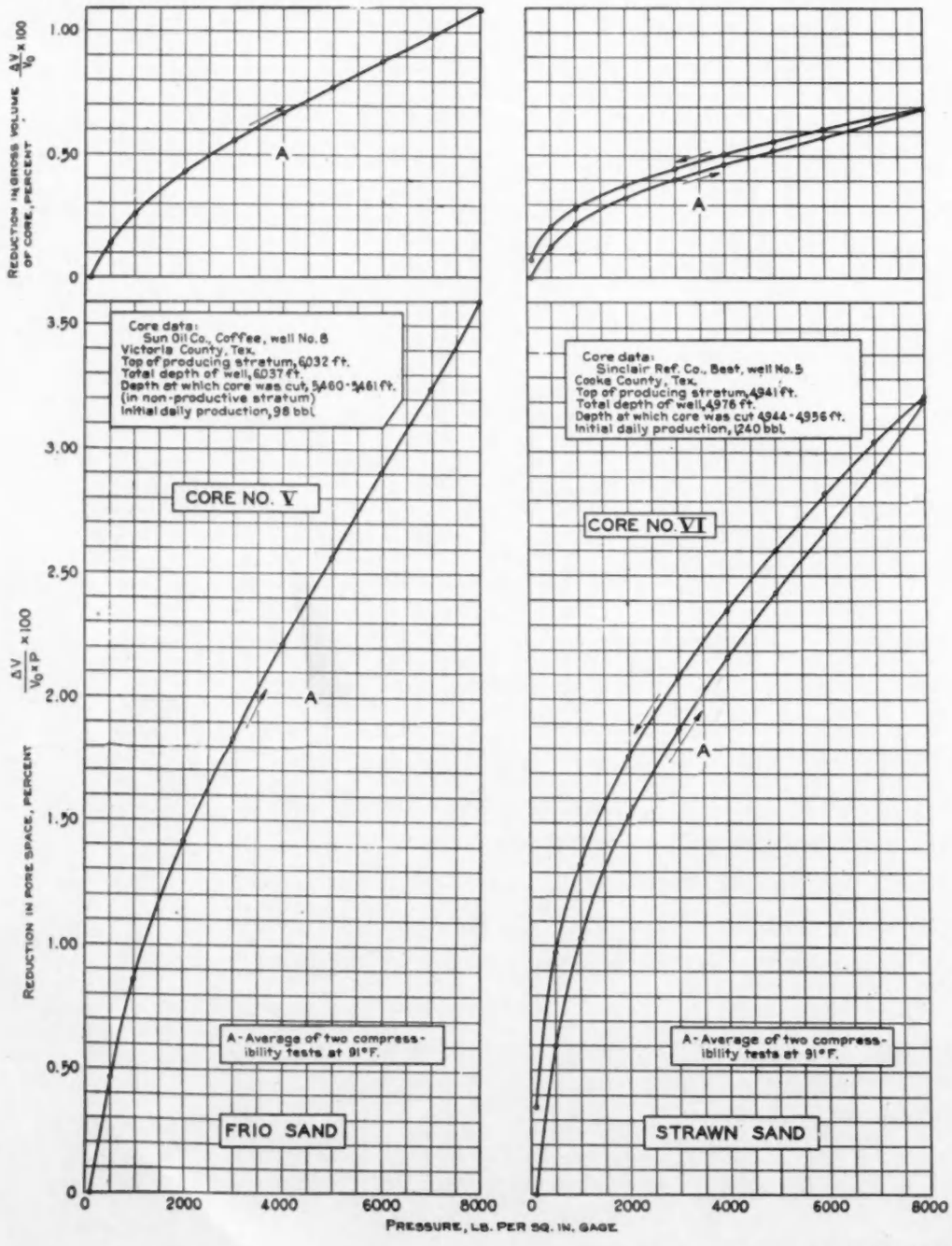

FIGURE 3

Pressure-Volume Relations for Frio and Strawn Sandstones

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from friend to friend

A MERRY CHRISTMAS

and

A HAPPY NEW YEAR

OIL WELL SUPPLY COMPANY

tion in the gross volume of the sandstone cores when compressed may be the result of the following physical changes:

1. The sand grains in sedimentary rocks are not spherical or equal in size and under pressure may become packed closer together by temporary deformation.
2. The individual sand grains of the sedimentary rocks may become smaller and may be forced closer together.
3. The sand grains of the rocks may become fractured when the crushing strength of the minerals is exceeded. (If this were true, however, a permanent deformation should result, and the gross volume after compression should be less than before compression. The results of these tests indicated no parmanent deformation.)
4. The sand grains may readjust themselves in the matrix of cementing material, or the cohesion between grains may be destroyed. (If this were true, however, permanent deformation should result, and the gross volume after compression should be less than before compression. The results of these tests indicated no permanent deformation.)

The results of the tests performed in this investigation are believed to indicate the underground effects on reservoir rocks as the pressure in the reservoir is reduced by the withdrawal of oil, gas, and water. The apparatus used was adapted to compression tests more readily than to decompression tests; hence, the writers have relied mainly on the results of the compression tests.

A maximum pressure of 8000 pounds per square inch was applied because that was the maximum safe working pressure of the apparatus. Assuming pressure resulting from the weight of the formations overlying a petroleum reservoir to be one pound per square inch per foot of depth and a normal hydrostatic pressure in the reservoir of 0.434 pound per square inch (pure water), then 8000 pounds per square inch is equivalent to the normal differential pressure to be expected in a well 14,134 feet in depth ($14134 \times 1.0 - 14134 \times 0.434 = 8000$). No oil or gas has yet been produced from a depth exceeding 13,266 feet [21]; hence this differential pressure of 8000 pounds per square inch is adequate to simulate the known conditions currently existing in oil and gas wells.

The depth of most currently producing wells in the United States is less than 8000 feet, so that the differential pressure tending to compress the reservoir rocks in most fields is much less than the maximum pressure of 8000 pounds per square inch applied in this investigation. For example, the maximum differential pressure that possibly could be applied on the reservoir rocks in the East Texas oil field, at an average depth of 3600 feet, would be approximately 3600 pounds per square inch. (This unlikely condition could exist only if the hydrostatic or reservoir pressure was reduced to zero pounds per square inch.) As the maximum reduction in volume of the pore space of Woodbine sandstone (oil-bearing rock in East Texas oil field) at a differential pressure of 3600 pounds per square inch, according to the curves (Figures 1 and 2) was approximately 1.9 percent, the compressibility of oil-bearing sandstones is not considered to be a material factor in estimates of reservoir content and ultimate recovery or the performance of petroleum reservoirs.

During the tests a temperature of 91° F. was maintained in the water bath because that was the most convenient temperature to maintain in the test apparatus. Two tests, however, were made on cores I and II of Woodbine sandstone at 146° F.[22] (original reservoir temperature in the East Texas oil field) to determine the relationship of temperature and compressibility. The results of one test at 146° F. (core I, Figure 1) showed a decrease in compressibility over tests run at 91° F., whereas, the other test, (core II, Figure 1) showed an increase in compressibility. The erratic results of these two tests indicated no apparent relationship between compressibility and temperature at pressures up to 8000 pounds per square inch.

Although the results of this investigation are believed to be analogous to the volume changes effected in a petroleum resorvoir when the hydrostatic or reservoir pressure is reduced, a few possibilities of error exist. The assumption that the pressure applied externally on a core with a diameter of 1.37 inches is transmitted undiminished to the sand grains near the center of the core denies the possibility of a "keystoning" effect produced by the consolidated sand grains near the periphery of the core. Such an effect would cause less compression near the center of the core; consequently, less water would be expelled from the core than if all pore space was reduced uniformly.

Another possibility of error lies in the imperceptible deformation or stretching of the metal jackets when they are forced into the depressions between the sand grains. This effect would cause some water to be expelled from the core that was not due to reduction in pore space and would magnify the results.

Conclusions

The results of this investigation to measure the reduction in volume and the compressibility of consolidated oil-bearing sandstone rocks showed that for the rocks tested a differential hydrostatic pressure of 8000 pounds per square inch caused a maximum reduction of 1.084 percent in gross volume and a maximum reduction of 3.608 percent in pore space.

From these results it was deduced that the compressibility of oil-bearing sandstone rocks is not of sufficient magnitude to have an appreciable influence on estimates of reservoir content and ultimate recovery or on fluid and energy relationships of petroleum reservoirs. The maximum pressure applied in tests is equivalent to the normally contemplated differential pressure in wells at a depth of 14,134 feet. As most currently producing wells do not exceed depths of 8000 feet, it seems likely that the possible reduction in volume and compressibility on the oil-bearing rocks in these fields is much less than the maximum compressibility measured in this investigation and therefore can be ignored.

No compressibility tests were made with shales, but it is believed that sedimentary rocks composed of shale should exhibit much higher reduction in volume than sandstones; it is concluded, therefore, that subsidence of the surface over some oil fields results from dehydration and consequent shrinkage of the shale beds adjacent to oil-bearing reservoir rocks and not from changes in volume occurring within the reservoir itself as a result of the reduction of pressure when oil, gas, and water are withdrawn.

[21] Fohs Oil Co., Bourg, well 1, DeLarge field, Terrebone Parish, La., producing depth, 13,254-13,266 ft.

[22] Reistle, C. E., Jr., and Hayes, E. P., A Study of Subsurface Pressures and Temperatures in Flowing Wells in the East Texas Field and Application of These Data to Reservoir and Vertical Flow Problems: Bureau of Mines Rept. of Investigations 3211, 1933, 30 pp.

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OLEAN, N. Y.

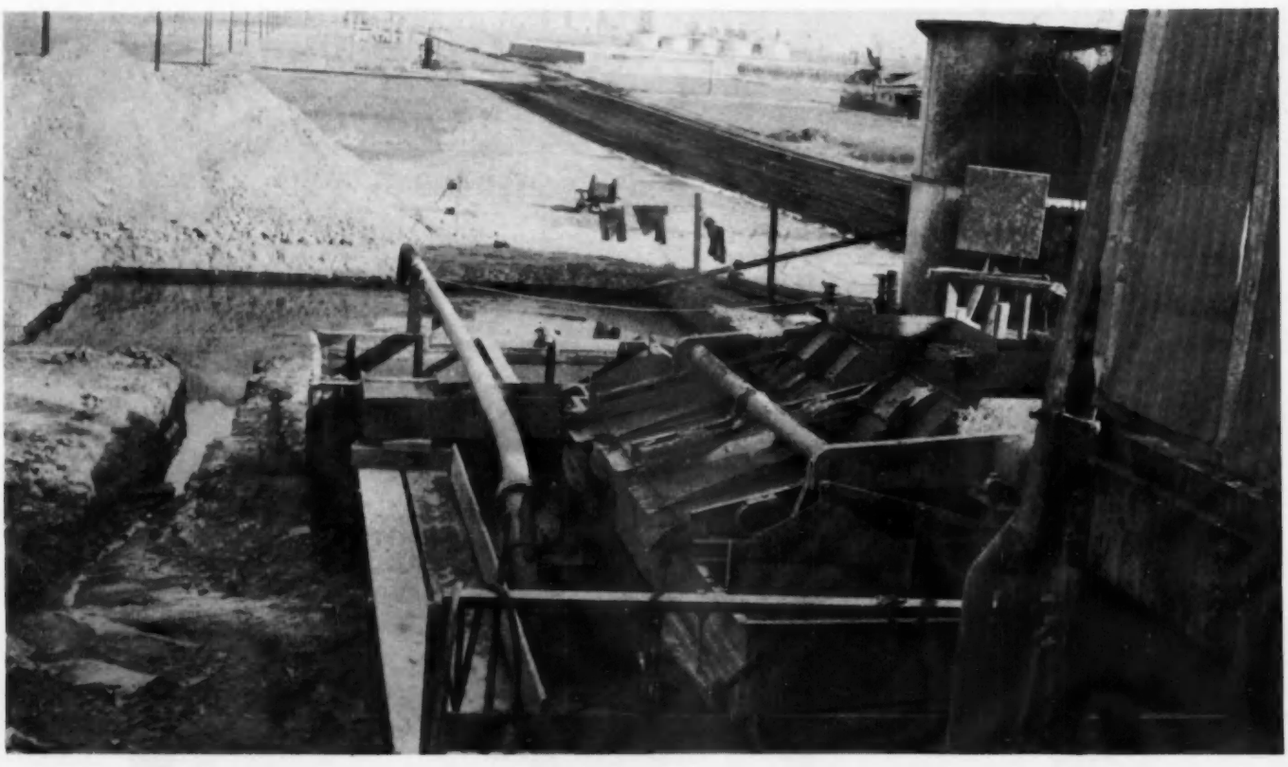
Shale Shaker-Desander Is Efficient Device

SEPARATION of fine grains of sand from drilling mud has not received the full attention that should be given this problem, in spite of the fact that all rotary operators are painfully aware of the damage to pumps, bits and drill pipe from abrasion by sand suspended in the circulation fluid. Without going into details regarding specific damage that may be encountered because of suspended sand, it would appear that considerable saving of equipment could be had by reducing the sand content of the mud. Drilling mud has been investigated from both the scientific and practical points of view so that its characteristics might be improved, and remarkable progress has been made. Shale shakers have become so common that they are now considered an essential part of any drilling rig. These remove larger grains of shale, rock and pebbles from the returns, but the particles small enough to slip past the shaker screens with the mud largely have been ignored. Washouts, bit wear and the deterioration of pistons, liners and rods of mud pumps have been attributed to the cutting action of fine-grained sand, which also accelerates mechanical wear.

Union Oil Company has gone a step further than most companies in combating this trouble and has developed a sand removing device which requires no power and but little attention, and which has in fact been popularly dubbed by drilling crews, "the roughneck's friend." This piece of equipment which is now becoming a standard addition to the rotary drilling rigs of the company depends altogether upon gravity and a quiescent section of a tank so that sand particles can settle from the circulated drilling mud.

The principal part of this separator is a large rectangular vat, or steel tank having a sharply sloping floor, adequately braced and mounted on skids, with a superstructure where the twin shale shakers are mounted. The tank is made in two sections, with the dividing wall running across the vat between the shakers, which are equipped with a steeply tipped apron below so that the mud passing through the screens will flow into a transverse flume at the side of the vat. The shakers are mounted on substantial I beam cross members, permanently attached to the sand-settling tank, so that the shale-disposal aprons of the screens themselves can be extended over the rim of the tank for the refuse cuttings to fall into a temporary disposal vat outside the sand-settling section.

The size of this vat is at least 30 inches longer at each end than the combined width of the pair of standard shale shakers. The width is approximately twice the length of a shaker to provide capacity



Looking down on shale shakers and shale jet section of mud vats with sand dump door, below shaker apron, with supporting rods and sponge rubber gasket. Control door at right near shaker assembly.

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through which the mud can flow, and to provide the necessary quiescent section for suspended sand to settle from the mud. The floor of the tank slopes sharply from front to rear so the precipitated sand will flow to the lower side where it is dumped by opening a swinging door, one in each section of the vat, and controlled by manually operated levers.

The transverse flume into which the mud flows from the shakers is made with a trap door at each end which may be raised or lowered with manually operated levers. The doors slide in guides which fit closely enough that the mud will seal the edges, but not so tightly that they will move with difficulty. The guide, or stop at the bottom edge of the door is lined with a sponge rubber strip so that, if there should be an accumulation of sand in the guide, the compressibility of the rubber will furnish sufficient sealing to retard the flow of mud, or stop it entirely, from the transverse flume to the sand-settling section when the door is closed. These doors are provided at each end of the flume so that when both are open, the mud will flow from the flume to the settling sections in equal volume, but when one is closed, all of the fluid coming from both shakers will be forced to travel through one settling section of the vat.

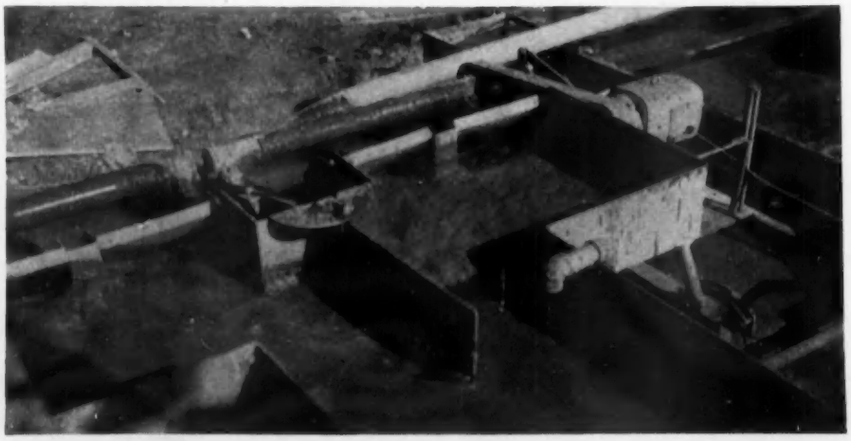
Each section of the sand settling portion of the vat has three wiers cut in the wall at the shallow side over which the mud is forced to flow when the vat fills and circulation is maintained. Across this side of the vat is a comparatively shallow flume which directs the desanded mud to the mud suction pit. The outlet flume is built as part of the unit, and passes down the side of the vat beneath one shale shaker motor with a right angle turn terminating in an apron that extends over the side of the suction tank.

Wiers over which drilling mud must flow when coming from settling section.

Each section of the sand-separating tank has a direct opening and closing door with the opening cut in the wall flush with the sloping floor. These doors are hung on rods with eye bolt connections and close by compression as they are pulled tightly against the facing of the openings. These doors are controlled with long levers and appropriate linkage, so that, when they are released, they stand open until their position is again changed by the movement of the levers. The reverse movement of the levers bring the door shutter snugly against the face of the opening, which is stripped with sponge rubber.

As the capacity of the combined sections of the sand-separating vat is sufficient to cause the circulated mud to quiet down in flow after leaving both doors at the openings of the transverse flume, the result is that most of the sand in suspension is precipitated to the sloping floor. The sand in the drilling fluid varies in percentage, depending upon the type of formation being penetrated by the drill, and upon inspection by the operator if the deposited matter is building up to a point that will disturb the quiescent settling basin, he drops one of the doors at the end of the flume which cuts off the flow of mud through that section. If the sand has become compact it is necessary to use a hose to wash the accumulation from the floor through the opening provided. After the sand has been disposed of, the swinging door is brought up tightly against the rubber-covered face, and the operating lever locked in place. The trap door at the end of the flume is opened, and locked in position, when the drilling mud begins to circulate through the cleaned section once more. The opposite section of the vat is cleaned in a similar manner. A steam jet is employed to evacuate the sand from the temporary pit. The lowest point in the temporary pit is fitted with a flange bolted to the metal, to which is connected the usual jet inserted in a length of 6-inch pipe leading to the permanent disposal pit. The steam line to operate the jet is laid at a convenient point near the unit with a valve having an extension handle for operating.

As the mud is directed to the shakers from the casing, it flows down a wide flume which is connected to the entrance of the shakers. A swinging door is installed so that the stream of mud can be directed to either shaker at will by removing the lock pin holding the door in position, or left standing straight out so that the stream of mud will separate in equal streams so that both shakers will receive their share of fluid.



Flume directing drilling mud to shale shakers. Divider in center is on a hinge so it may be swung to either side so the mud will flow to one shaker, or pinned in the center to divide the flow.

To our great industry ♦ the Oil Industry ♦ To the people in all its branches ♦ in all its fields ♦ who have labored for its progress ♦ we wish a Merry Christmas and a Happy New Year ♦

THE CONTINENTAL SUPPLY COMPANY ... DALLAS, TEXAS

Continental

SERVING THE OIL AND GAS INDUSTRIES

DRILLING CONTRACTORS' NOTEBOOK

Helpful Suggestions For Those Interested In Drilling Methods

Operating Ideas Maintenance Hints New Rig Hook-ups

Published as a regular feature of THE OIL WEEKLY

1. RIGGING UP

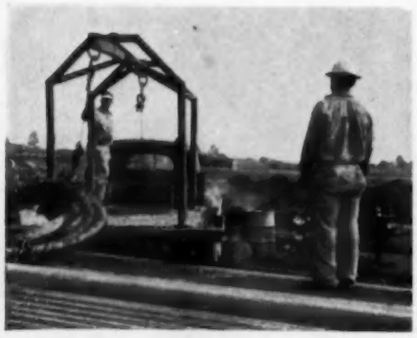
Derrick Supported by Bed of Timbers Where Foundation Is Impractical

A 20-ft. section of sandy soil makes practical a derrick foundation of heavy timbers.

INSTEAD of attempting to run a concrete foundation through some 20 or more feet of loose sand, Carl Short, Inc., contractor, has provided a heavy bed of timbers to support his derrick in Cumberland field, Oklahoma. In addition to giving a large bearing surface sufficient for the complete rig, the construction is rigid, less expensive than the deep foundation would be, has considerable salvage value, and requires less time in construction.

2. MATERIALS HANDLING

Frame on Truck Bed Increases Use



A frame over this service truck bed facilitates handling heavy equipment.

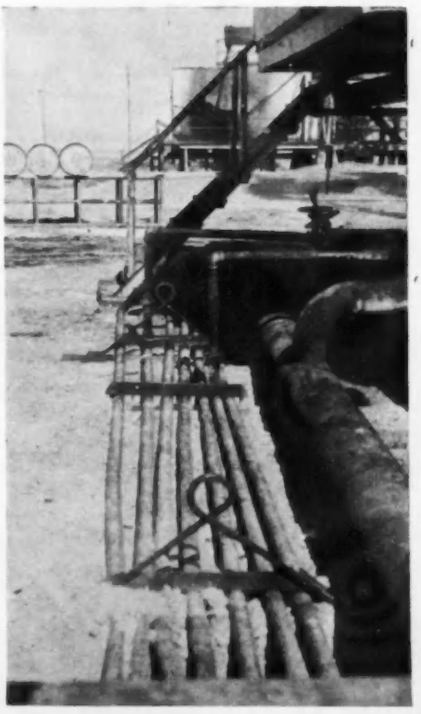
SO that a service truck will be self-sufficient when handling material weighing too much for men to lift, a frame may be built over the bed, using two risers on each side, with rafters supporting an I-beam. Rings are placed at each end of the I-beam to hook snatch blocks, providing sheaves through which the winch line travels.

When skidding heavy items from the dock to the truck, a third block may be used to provide a pull of two lines. When moving material from the truck to the dock, the third snatch block may be snubbed to sills and the free end of the line, with its hook, used to skid the object to the required location.

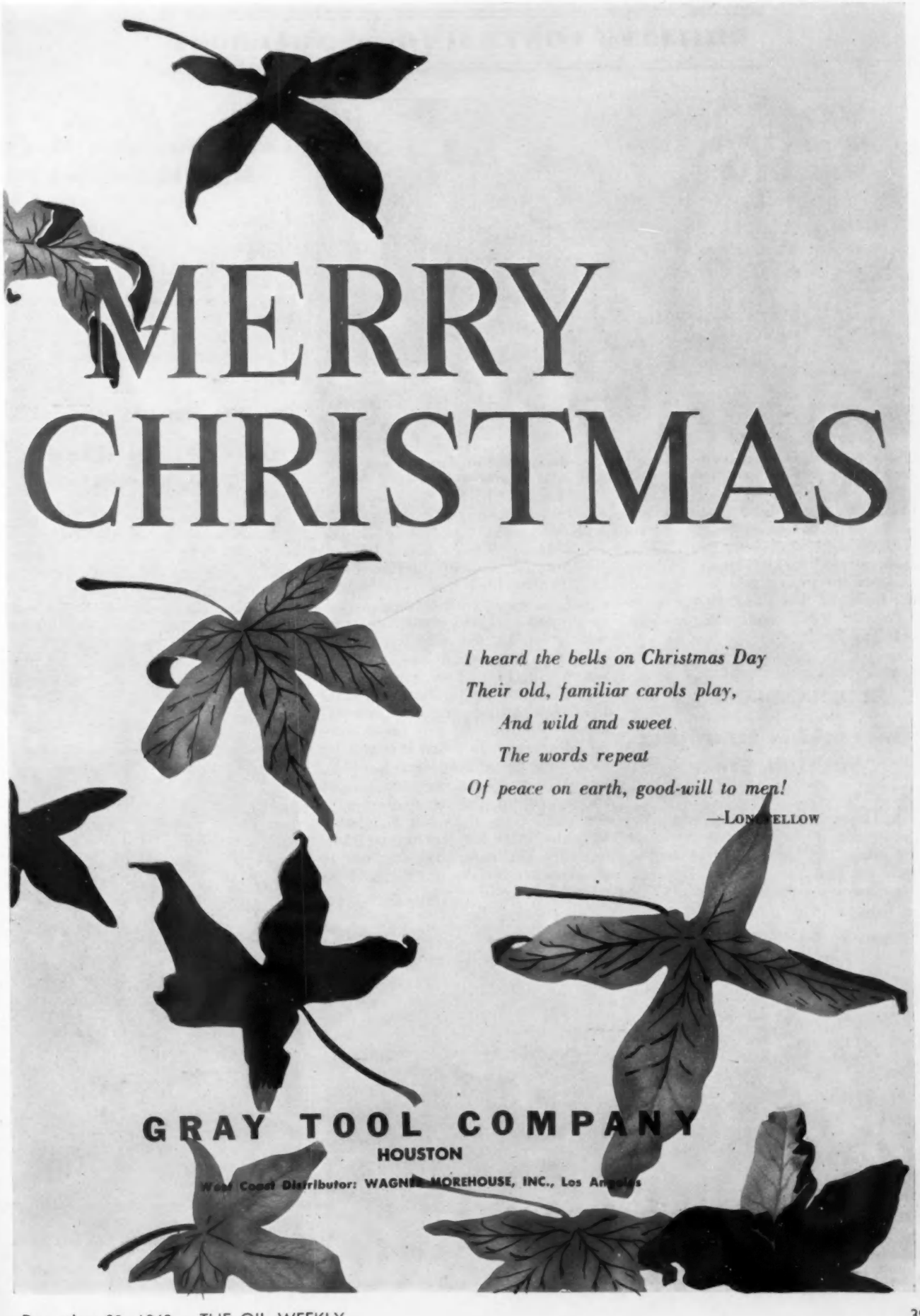
3. MATERIALS HANDLING

Bails Provided for Service Lines

WHEN pipe is assembled in units for service lines, handling the various sections may be facilitated by attaching bails at the most convenient points, paying particular attention to balancing the load. The bails may be made of sucker rod attached to angle iron laid beneath the bundle of pipe, with a second piece of angle iron laid on top of the pipe and joined to the



Lifting loops on unitized pipe sections aid in moving with truck boom.


MERRY
CHRISTMAS
I heard the bells on Christmas Day
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And wild and sweet
The words repeat
Of peace on earth, good-will to men!
—LONGFELLOW
GRAY TOOL COMPANY
HOUSTON
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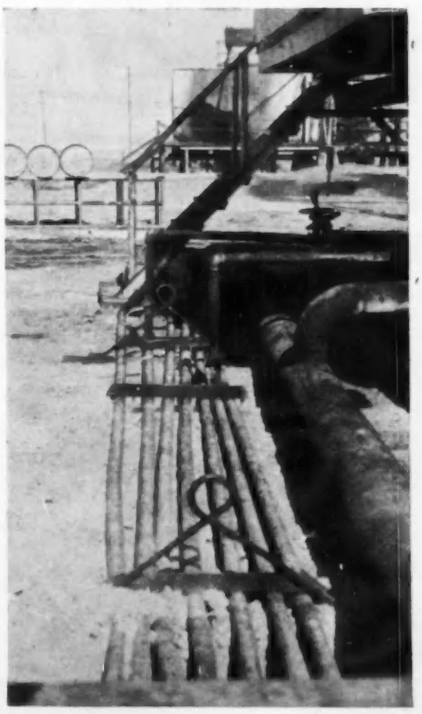
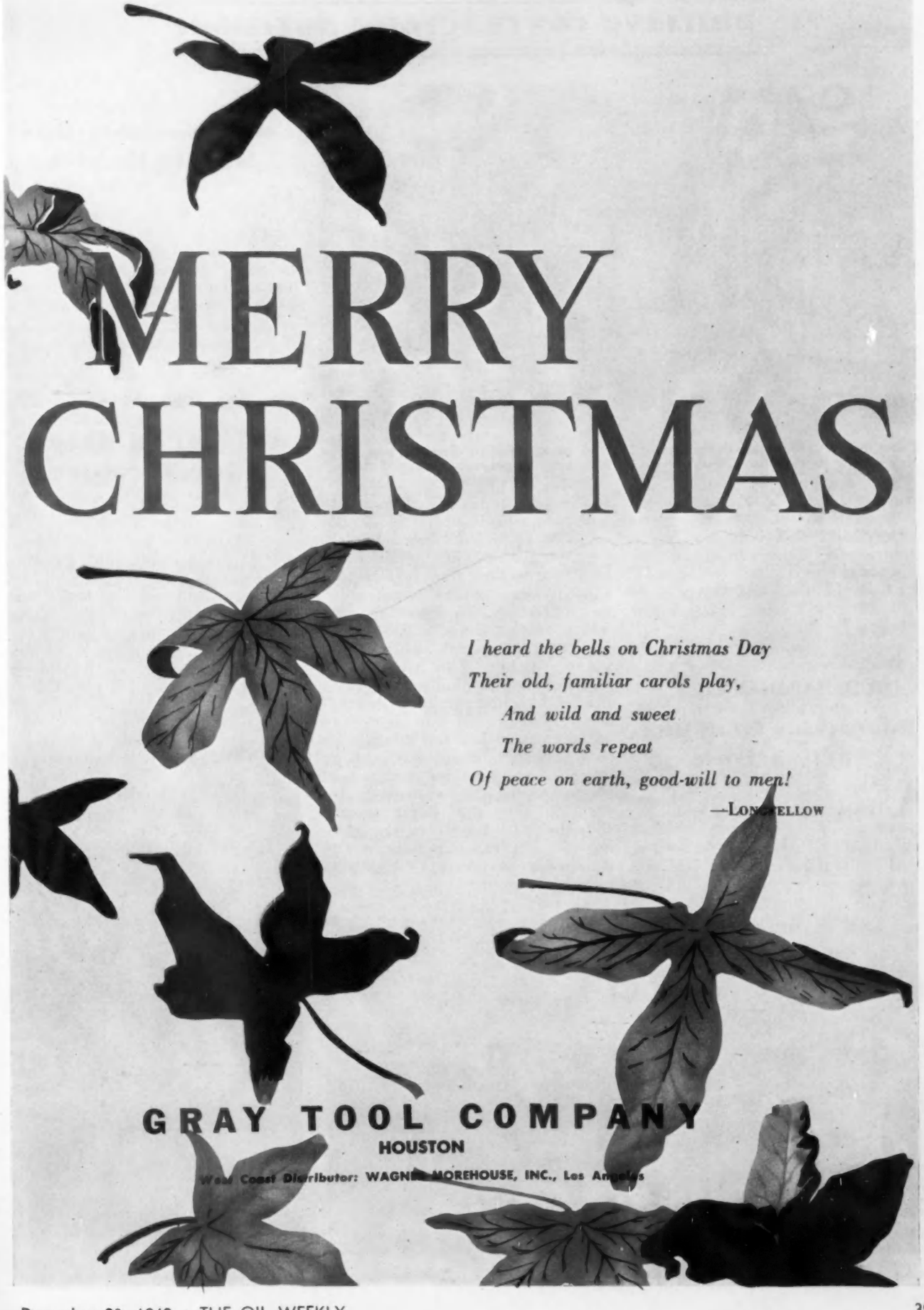


Lifting loops on unitized pipe sections aid in moving with truck boom.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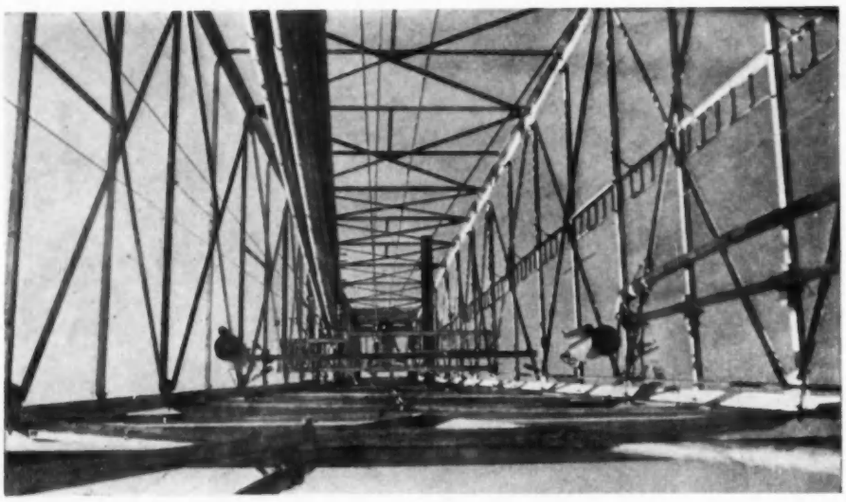


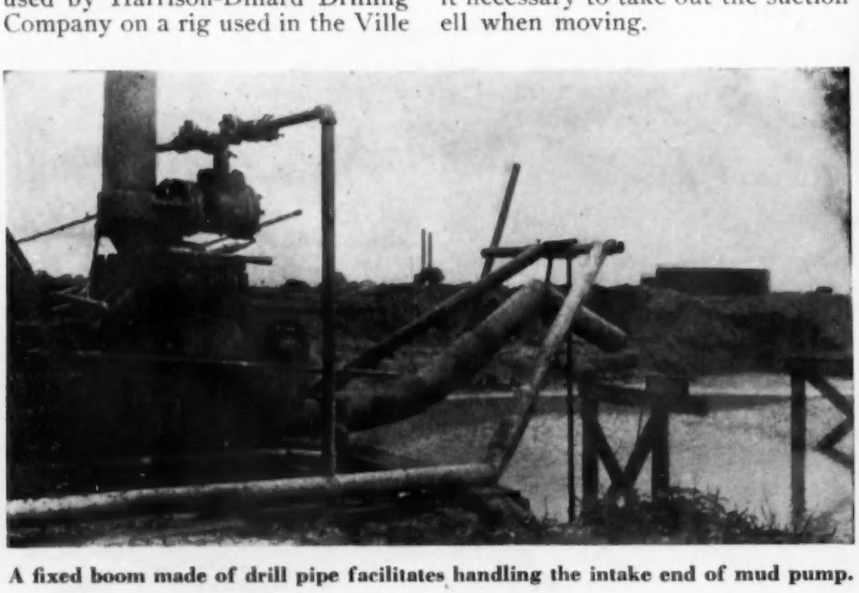
These drill-tong counterbalances hang high in the derrick so they will not strike men on the derrick floor, and are snubbed to girts to prevent accidental falling.

lower end with bolts. As the joints of pipe in the bundles are fitted with unions, breaking out these connections makes separate sections of the piping which can, with the bails, be lifted and moved with a winch truck equipped with a rear-end boom.

4. MUD HANDLING

Boom Aids Handling Suction Hose

A HANDY method of handling the intake on the pump at the mixing pit, or on the regular pumps, is used by Harrison-Dillard Drilling Company on a rig used in the Ville Platte field, central Louisiana. The end member of the pump skid is replaced by a fixed boom of drill pipe. Upper ends of the boom sections are welded transversely to a short section of pipe through which is slipped the still smaller section which acts as the windlass, carrying the rope which suspends the pump suction. The windlass is turned by a pipe handle to regulate the height of the suction with varying pit fluid levels. The boom may be taken apart in a few minutes by loosening the studs which hold the windlass, and breaking out the tool joints forming the connection with the skid. It is thus not necessary to bother with the erection or moving of a separate windlass, nor is it necessary to take out the suction ell when moving.



A fixed boom made of drill pipe facilitates handling the intake end of mud pump.

5. RIGGING UP

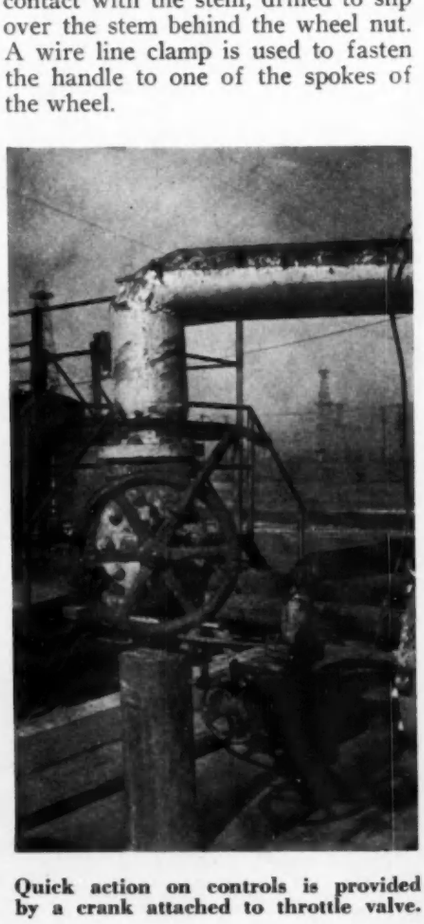
Counterweights Hung High in Derrick

COUNTERWEIGHTS for pipe tongs may be hung high in the derrick to remove them from the derrick floor simply by shortening the cable. Snub lines attached to the bails and to a girt of the derrick would prevent them from falling if the tong line should break.

6. MUD HANDLING

Gate Wheel Handle For Throttle

AS a convenience for the mud-pump operator, a gate wheel handle can be made for the throttle by using a short nipple of ¾-inch pipe, shaped to fit the hand and flattened at the point where the longest end makes contact with the stem, drilled to slip over the stem behind the wheel nut. A wire line clamp is used to fasten the handle to one of the spokes of the wheel.



Quick action on controls is provided by a crank attached to throttle valve.

HIGHLIGHTS IN THE WEEK'S NEWS

Inventories

Sinclair Asks Larger Gasoline And Crude Inventories

H. S. Sinclair, executive committee chairman of Consolidated Oil Corporation, New York, last week declared that larger inventories of crude stocks should be maintained to guarantee smooth functioning of the industry.

"I do not share the opinion which has been often expressed over a long period of time that these inventories are excessive," he said. "We are using about 3,000,000 barrels of crude oil a day east of the Rocky Mountains. Crude oil in storage in this area at this time approximates a total of 227,000,000 barrels, or only about 75 days' supply.

"It is a mistake to think of this raw material as being piled up somewhere and about to engulf us. Many millions of barrels are not really available at all. If the industry is to continue to function, the pipe lines must always be full; hundreds of refineries must have working stocks on hand; millions of barrels must always be in transit on the water. So we really haven't 75 days' supply—probably less than half of that. I believe we are going to have a greatly increased demand for petroleum products, and we therefore need more oil in storage. Crude oil stocks are too small rather than too large. I also think that those who are pinching down production according to some outgrown formula are going to find that they have missed their mark and underestimated our needs. We need the insurance of an ample supply of crude. We only know we have such a supply when it is in steel storage above ground and located where it is needed.

"I feel even more strongly about gasoline stocks," Sinclair added. "Anxiety is expressed because we have a few million barrels more than someone estimated several years ago was the ideal figure. We should have more because consumption is greater. I know of no excessive stocks in any area. It seems to me that less than two months' supply of gasoline is very little for an industry as vital as ours to all industry, to defense and to the necessities and well-being of the whole country. No other industry similarly situated would think of operating on so narrow a margin of safety. And as noted with respect to crude, the stocks of gasoline are not really available in any such amount as would be indicated by the figures. Gasoline must be stored in hundreds of terminals, thousands of bulk stations and several hundred thousand service stations; in pipe lines and otherwise in transit. The greater part of it must always be there if 1,500,000 barrels of gasoline are to be available every day.

"I look for a considerable increase in consumption in 1941. There are more cars and there will be more use of them. We don't want any more 'gasless Sundays' or rationing. The defense program, when it is in full motion, will lead to much larger demand. The latest estimate we have of 1941 consumption made by Dr. A. G. White, of the Bureau of Mines, is that the increase will be from 8 to 9 percent. If this estimate is correct, there will be a period of months beginning probably in the second quarter when the increase in consumption is sure to be more than 10 percent. This means that we shall need an additional 150,000 barrels of gasoline every day (or, roughly, 350,000 additional barrels of crude daily), over and above what we are now using."

October Crude Drops 63,000 Barrels Below September

Average crude runs to stills dropped to 3,529,000 barrels a day in October, 63,000 barrels under September and 51,000 barrels under October, 1939, according to the monthly report of the United States Bureau of Mines.

Imports also dropped, by 7000 barrels, to a daily average of 123,000 barrels, the bureau reported.

Total receipts at refineries in October were 108,874,000 barrels, of which 105,059,000 barrels was domestic and 123,000 barrels foreign, it was stated. Total crude runs to stills were 109,394,000 barrels, and fuel and losses 317,000 barrels, resulting in withdrawals from stocks of 1,163,000 barrels.

Stocks of crude at refineries at the close of the month were 52,726,000 barrels, compared with 53,563,000 barrels at the end of September.

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Federal Control

President Asks Federal Control Where States Do Not Act

Legislation giving the government control of petroleum production in states which have no adequate regulation has been asked of congress by President Roosevelt as an "urgent need," it was learned in Washington last week coincident with the disclosure that railroad opposition has interfered with plans of the National Defense Advisory Commission for the development of new pipe lines.

The President's request for the legislation was voiced in a letter to Representative William P. Cole, Jr., chairman of the oil subcommittee of the House Interstate and Foreign Commerce Committee November 29, which was not made public until last week in order that members of the group might first consider the course they were to adopt.

On the basis of the letter, however, Cole some days ago called for further hearings on oil, which he later postponed because of the inability of the National Defense Advisory Commission to prepare the material it proposed to submit.

It is now expected that the hearings will be called shortly after the new congress convenes January 3, and that members of the commission, officials of the War and Navy departments, Secretary of the Interior Ickes, and oil company executives will be called to testify.

President Roosevelt, in his letter, made it clear that he was not asking for enactment of the original bill, prepared in the interior department, which proposed to apply government regulation to all oil production, but the adoption of the measure as revised by Cole last spring, which would impose control only in states which of themselves had made no move to regulate output, or where the state control had proven insufficient to prevent waste.

The bill was rewritten at the suggestion of the President himself, after the governors of the oil-producing states had registered a violent protest against the original legislation.

The revised bill was specifically referred to by the President in his letter, in which he pointed out that "last spring I wrote a letter to you in which I discussed the desirability of petroleum conservation legislation. I expressed several ideas that I hoped would be helpful to your committee in meeting the objection that had been voiced as to the proposed legislation which you have before you for consideration.

"The vital need for petroleum in the national defense," he continued, "its importance in commerce and industry, and the critical condition of Europe and Asia, confirm my belief in the urgent need of federal legislation to safeguard our petroleum supply through the prevention of waste and by the establishment and maintenance of sound economic conditions in the oil industry. I am sure that your committee has given

this important matter careful consideration, and I am hopeful that a satisfactory solution with appropriate recommendations will be reported in the near future."

Neither version of the oil legislation received much support in congress, and lengthy hearings before the subcommittee demonstrated that any form of federal control would be unpalatable to the states and the industry. The proposed easing of the revaluation to apply only to states not under any control was viewed merely as an effort to get the camel's nose under the tent, and the question was raised as to what the federal authorities would consider adequate state control when they undertook enforcement of the measure.

With the raising of the defense issue by the President, however, the situation is viewed as being somewhat changed. It is expected that the legislation will be urged by representatives of the defense commission and the government departments who will testify before the committee, and congress itself has proven highly receptive to suggestions for legislation based on the needs of the national defense program.

Pipe Lines

Railroads Oppose Planned Defense Pipe-Line Systems

Railroad opposition is proving a stumbling block to the National Defense Advisory Commission's closely guarded plans for the building of pipe lines to carry oil and oil products to strategic defense positions along the Atlantic seaboard.

Aside from its disclosure to Attorney General Robert P. Jackson last September that such lines were being planned, with the suggestion that anti-trust proceedings looking to divorce, then contemplated, might interfere with that program, the commission has maintained strict secrecy regarding the projects.

It has been reported, however, that two lengthy systems, estimated to cost possibly $65,000,000, are under consideration, but no intimation has been given by the commission or other administration officials as to how close to consummation the deals have been brought.

Railroads Protest

It is understood that representatives of the railroads have registered a protest against the construction of new pipe lines, contending that the rails are in a position to care for all the oil traffic that may develop under the defense program and even in the event of war. They are represented as claiming that their lines are as safe from attack as pipe lines would be, that in the event a rail line should be cut by an enemy, alternative routes could immediately be used, and that should there be any interference with a pipe line, all service would be stopped, whereas such interference with the railroads would cause only a temporary emergency.

Back of their arguments, however, is their major ground for opposition—that the roads for some years have been in serious financial straits and are only now beginning to make more than expenses and that, after the expiration of the emergency, the proposed pipe lines would be a serious threat to their revenues.

Representatives of the carriers asked for an opportunity to be heard during the hearings which William P. Cole, Jr., chairman of the oil subcommittee of the House Interstate and Foreign Commerce Committee, planned this month, and are expected to renew their request when the hearings actually are held.

Meanwhile, the whole pipe-line situation remains shrouded in official secrecy, with no information available as to who will build them, where they will run, their capacity, or how they will be financed.

New Jersey and Shell Plan Gasoline Line

One of the pipe lines referred to in a Washington dispatch [above] would be a gasoline line in which the Standard Oil Company of New Jersey and Shell Oil Company would participate. It would run from the Baton Rouge district north and east, having two eastern terminals, one on the upper Atlantic Seaboard and the other in Florida. Opposition to the construction of this line has been made by the railroads. The proposed line would run through Alabama and special difficulty has been encountered in Alabama in securing carriers permit to operate in the state.

The other line evidently is a crude-oil line which has been considered by the defense council. Apparently its sole value would be from the standpoint of defense, because such rates as it might establish would be so high as to make its normal competition with tankers impractical.

Such a line has been considered as a defense measure to move crude oil to Eastern refineries in the event of war and attack on tanker movements from producing areas to the Atlantic Seaboard.

According to the latest available statistics from the API on refinery runs on the Atlantic Seaboard, this area is running around 550,000 barrels of crude oil per day. It would, of course, be a highly impractical idea to propose to prepare to move this amount of crude by pipe line and so far as can be ascertained, no such plan is in mind. It is probable that any line which might be built would have a capacity of less than a fifth of that amount.

So far as can be ascertained in oil circles, no oil company or pipe line company is involved in the rumors that a crude line may be built.

Federal Loan

Rumors arising some time ago indicated that a federal loan would be made in the event such a line were built. Thus far, the federal government has not gone into the pipe-line business and government ownership of pipe lines would fall into the same category as ownership of railroads—a proposition which might find Congress entirely unenthusiastic.

At this time the refineries on the Atlantic Seaboard which would be served by such a line are all owned by the companies which the government attacked in suits some time ago and the line would serve no good purpose for any independent refining units in that area, because there are no such units there.

If such a line were built, it would not likely be used unless enemy attacks on water transportation crippled such transportation, because of the difference between even high tanker rates and the rates which such a line could employ.

THE OIL WEEKLY has contacted no oil man or pipe-line man who felt that such an idea as the government-financed crude-oil line, is practical.

Refining Capacity Causes Study of War-Time Sources

Although gasoline pipe lines have been treated as of major importance in connection with the nation's defense program, crude oil lines for supplying the large-capacity refineries of the Philadelphia-New York areas logically have come under close scrutiny also. For those plants normally are supplied with crude almost wholly by tankers, bringing in oil from the Gulf Coast and from South America. And serious interruption of shipping would call for heavy movement of crude from the Southwest by pipe lines or railroad tank cars. Only a part of the normal movement could be carried on, however, by the existing facilities for piping crude from the Mid-Continent to the Atlantic coast.

Present facilities include three major crude oil pipe line systems, the Ajax, Illinois, and Tide Water systems. Crude may be shipped through those lines in large quantities into western Pennsylvania and thence dispatched to either the Philadelphia or the Bayonne-New York area. The several crude lines traversing the state of Pennsylvania have been called upon at different times to move large volumes of crude, sometimes eastward and sometimes westward, as major sources of crude have shifted. Consequently, those long established lines have been built up to comparatively large capacity. Furthermore, the facilities between the Mid-Continent and western Pennsylvania have been enlarged as time has elapsed, and important additions have been made in the past few years in consequence of the development of the new Illinois fields.

However, the only regular movement of crude now from the Mid-Continent to the East Coast is that inaugurated less than two weeks ago by Gulf Oil Corporation between Cushing, Oklahoma, and its refinery at Philadelphia. (For that movement a pipe line tariff of 57 cents a barrel applies.) For some time before that movement was started, no crude was being transported from the Mid-Continent to the Atlantic coast, although Standard of New Jersey was similarly piping Illinois crude to Bayonne until the rapid decline of Illinois flush production got under way several months ago.

The refining capacity on the East Coast currently is approximately 650,000 barrels daily, with plants operating to 85 percent of this capacity. The plants normally process some foreign crude in addition to domestic crude, and imports of crude into the United States, mostly received on the Atlantic coast, have been averaging around 120,000 barrels daily in recent months.

However, interference with shipping would affect both domestic and imported crude, and from a defense standpoint, the ideal situation would be one in which it would be possible to move by pipe line from the Mid-Continent and the Middle West all the crude required by the East Coast refineries.

That such movement is not economically sound normally, however, as an alternative to shipment by tankers, is evidenced by the fact that such piping has been exceptional rather than the rule. For normally, movement by water is more economical, as proved by the fact tanker rates ordinarily are much lower.

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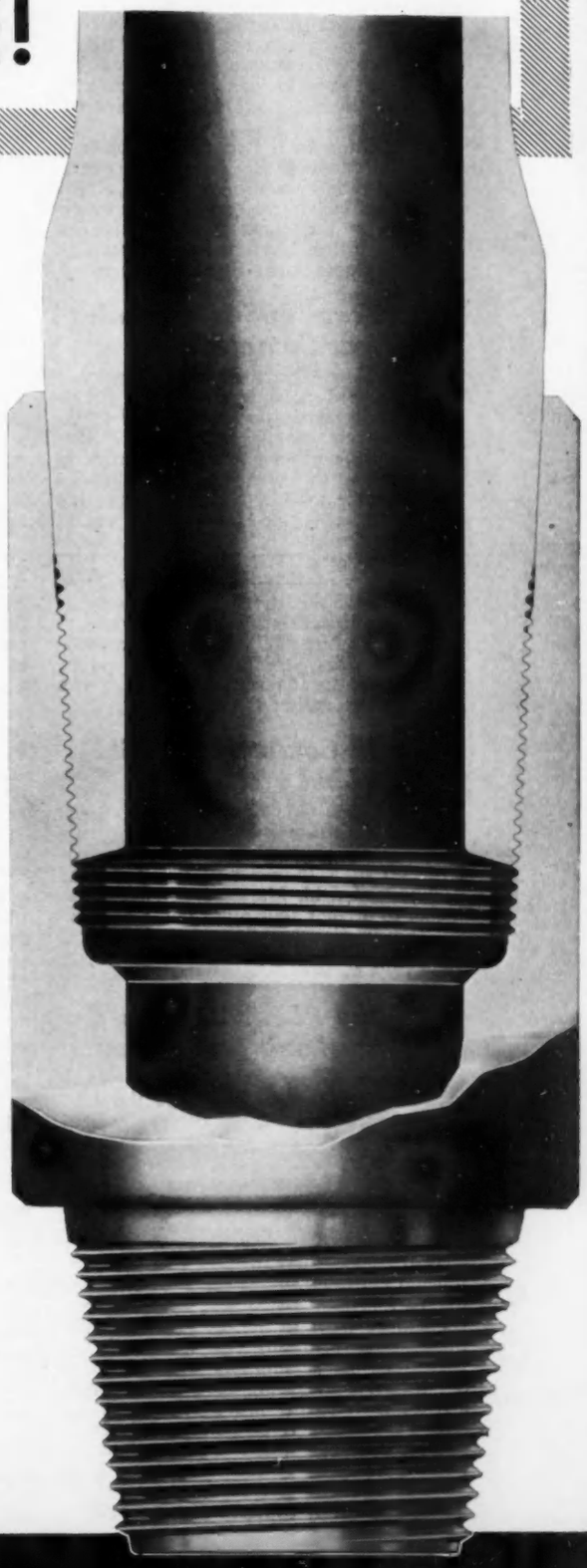

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effect from Oklahoma points to the New York area, a rate of 76 cents a barral applied. And if crude had originated on the Gulf Coast, its movement from there to Oklahoma would have cost 25 cents a barral. Thus the total cost of piping the oil from the Gulf Coast to New York area refineries would have been about $1 a barrel. Even with tanker rates now at all-time highs, the charge for moving crude from the Gulf Coast to the North Atlantic is around 70 cents a barrel, and the long-term average has been much lower, with the rates dipping at times below 20 cents.

In addition to the crude oil pipe lines across Pennsylvania there are several gasoline pipe lines in that and adjoining states, which move gasoline from refineries on the coast to inland points, such facilities having been expanded gradually somewhat in recent years.

West Texas 105-Mile Crude Line Near Completion

Texas-New Mexico Pipe Line Company has completed pressure tests on a 105½-mile gravity crude line, which will transport oil from the Duggan-Slaughter district, most northerly producing area in West Texas, to Midland, where deliveries will be made to Gulf Refining Company's tank farm and pipe-line terminal on an exchange agreement. The carrier is made up of 4 miles of 14-, 82½ miles of 8⅝- and 19 miles of 10¾-inch, and has a rated capacity of 8000 barrels daily. It will be placed in operation upon completion late this month of an 80,000-barrel and a 5000-barrel receiving tank at the field end of the line. South Plains Line Company has contracted to gather the oil.

Pure Oil Company to Build Cumberland Field Outlet

The Pure Oil Company last week awarded contract to B. & M. Construction Company, Oklahoma City for construction of a 16-mile pipe line from the Cumberland field, Marshall County, Oklahoma, to a point four miles north of Durant, Bryan County, where it will connect with the trunk system of Texas-Empire Pipe Line Company.

Recycling Plant Authorized For Grapeland, East Texas

Fourth recycling plant for the Grapeland field, on the south end of the East Texas Woodbine belt, has been authorized by Geier Bros., Inc. and F. B. Jackson, Jr., Dallas producing partnership. Contract was awarded to the Hudson Engineering Company, Houston, for completion of a 53,000,000-cubic-foot daily capacity plant by mid-April, 1941. John L. Hill, formerly head of the gasoline department of the Continental Oil Company, is chief engineer for the partnership, which will drill between six and 10 wells to the 6000-foot gas-distillate sand prior to completion of the plant. The partnership has acquired farmout leases, aggregating 3000 acres within and adjacent to the proved area, and recently purchased J. C. Cook et al's Masters-Shell 83-acre lease, with a completed well.

Texas Commission Holidays

The Texas Railroad Commission will close its offices at the conclusion of business on Monday, December 23, and remain closed until January 2.

Allowables

Bureau Sees Heavy Demand for 1941; Sets January Figure

A sharp increase in imports, heavy withdrawals from stocks and increased domestic production will be required next year to meet the nation's demands for oil, including those of the defense program, the United States Bureau of Mines warned December 18.

Foreseeing an increase of not less than 8 percent in domestic demand in 1941 over that of this year, the bureau estimated that an increase of at least 10,000,000 barrels in imports, a decrease of similar size in stocks and an increase of two percent in daily average crude production will be required to care for the situation.

The bureau's monthly forecast set crude production for January at a daily average of 3,591,000 barrels, 31,000 barrels above the estimate for December and 2700 barrels higher than the actual demand in January, 1940, but emphasized that this figure represents a "minimum" and its estimates may have to be increased in succeeding months if the trend of demand proves greater than now foreseen.

The bureau reported that daily average crude production during the four weeks November 9 to December 7 was 3,573,000 barrels, and runs to stills were 3,505,000 barrels, while, during the period, domestic stocks decreased at a rate of 32,000 barrels a day, indicating a daily demand of 3,605,000 barrels.

Attempting to chart the course of demand for the coming quarter, the bureau explained that to do so "it is necessary to consider the probable demand for all oils during the coming year to secure the proper perspective."

Eight Percent Gain "Reasonable"

"An increase of 8 percent in the daily average domestic demand for all oils in 1941, including special defense requirements and stocks, seems a reasonable and conservative assumption, assuming no drastic changes in international relations," it said. "This would amount to an actual increase of about 102,000,000 barrels for the year. A further loss in exports might reduce this figure to a 6 percent increase in the total demand for all oils, a gain of about 87,000,000 barrels in 1941 over 1940.

"Crude production of about 3,700,000 barrels daily in 1940 will be in excess of demand as indicated by an estimated increase in the stocks of all oils (crude and refined) of about 40,000,000 barrels for the year. Consequently, the same rate of production in 1941, with no stock changes, would supply almost one-half of the increased demand for all oils (87,000,000) as estimated above. The remaining increase of 47,000,000 barrels in the demand for all oils might be met by stock decreases of 10,000,000, by increased imports of 10,000,000, and by a gain in crude-oil production of 27,000,000 barrels. This would indicate a daily average crude-oil production of 3,775,000 barrels in 1941, an increase of 2 percent over 1940.

"The balance of possible refined oil exports, imports and stock changes would indicate an increase in crude runs to stills of over 4 percent, or an average rate of nearly 3,700,000 barrels daily for 1941."

If demand should materially exceed these estimates, it was pointed out, a direct increase in both crude production and runs to stills would result, and refinery operations east of California might be close to capacity, particularly if the crude runs in the first quarter are at too low a level.

"The abnormally high demand in the first quarter of 1940 will reduce the rate of increase in demand for the same period in 1941 below the estimated average for the year," it was explained, "but the relative increase in subsequent quarters would be progressively greater.

January Figure is Minimum

"The bureau believes that its forecast of crude runs and demand for January represents a minimum, and that these figures may have to be increased in subsequent forecasts for February and March if the trend of demand proves greater than now seems reasonably probable.

"The current adjustment of unbalanced refined inventories would indicate the continuance of the yield trends as shown in actual October operations, namely, a relatively low gasoline yield, a normal distillate yield, and an increased residual yield.

"A sharp rise in the demand for residual-fuel oils is indicated as defense activities get into full production. Residual-fuel stocks east of California, although several million barrels above the abnormally low level of last year, appear to be inadequate. As indicated in the December forecast, this situation would require either greater runs than are necessary for other products, increased residual yields or larger imports.

"Stocks of finished and unfinished gasoline apparently will be about 82,000,000 barrels on December 31, 1940. A normal increase of at least 14,000,000 barrels seems unavoidable in the first quarter of 1941, so that a peak of 96,000,000 barrels is probable on March 31, 1941, as compared with almost 104,000,000 barrels at that same time in 1940. This stock position would represent a material improvement because of the expected increase of 6 to 7 percent in domestic motor fuel demand during 1941, and also because the figure will include an increase of several million barrels in essential aviation-gasoline stocks."

Explaining its forecast for January, the bureau said domestic demand for motor fuel for the month is estimated at 43,000,000 barrels, 6.5 percent more

Bureau of Mines Forecast of Crude Oil Demand for January

State	Forecast January 1941	Forecast December 1940
Texas	1,297,500	1,277,000
California	594,800	593,900
Oklahoma	439,000	422,600
Illinois	340,300	363,600
Louisiana	287,400	280,300
Kansas	191,000	188,400
New Mexico	100,000	100,600
Wyoming	73,900	74,500
Arkansas	66,100	66,100
Pennsylvania	48,000	47,900
Michigan	46,100	47,100
Indiana	20,000	15,500
Montana	19,000	19,700
Mississippi	15,200	13,900
Kentucky	14,800	13,900
New York	13,000	12,100
West Virginia	10,000	9,000
Ohio	9,000	8,000
Colorado	3,900	3,900
Nebraska	2,000	2,000
	3,591,000	3,560,000

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than the actual demand in January, 1940. The estimate for exports, based on forecasts by the principal exporters, is 1,900,000 barrels, 100,000 barrels above the estimate for December but 374,000 barrels under actual shipments in January of this year.

It was pointed out that stocks of finished and unfinished gasoline on October 31 were 79,185,000 barrels and, according to statistics of the American Petroleum Institute, they declined approximately 500,000 barrels during November, indicating an inventory of about 78,700,000 barrels at the end of that month. Although finished gasoline stocks increased more than 7,500,000 barrels during January, 1940, because of the heavy demand for heating oil due to the extremely cold weather, the bureau estimates an increase of only 6,300,000 barrels for the first month in 1941.

With benzol production and direct sales of natural gasoline estimated at 1,500,000 barrels, the indicated refinery production is placed at 49,700,000 barrels, which the bureau allocates among the various refinery districts as follows:

Allocation to Districts

East Coast, 6,680,000 barrels; Appalachian, 1,850,000; Indiana-Illinois, 10,690,000; Oklahoma, 2,670,000; Kansas-Missouri, 2,800,000; inland Texas, 3,360,000; Texas Gulf Coast, 11,600; Louisiana Gulf Coast, 1,280,000; inland Louisiana-Arkansas, 880,000; Rocky Mountain, 1,320,000, and California, 6,580,000.

Determining factors in the crude situation will be the estimate of 7.1 percent, or 3,520,000 barrels, of the total refinery production for natural gasoline to be blended at refineries, and the yield of straight-run and cracked gasoline, estimated as 42.6 percent, which, applied to the production of 46,180,000 barrels, gives crude runs of 108,420,000 barrels, or 3,497,400 barrels a day.

The estimate for foreign crude run to stills has been raised 100,000 barrels to 3,700,000 barrels, which is 849,000 barrels higher than the actual for January, 1940, and crude exports are estimated at 3,900,000 barrels, the same as in the November and December forecasts. Crude to be used for fuel and losses is estimated at 2,700,000 barrels.

The total demand for domestic oil in January, as indicated by the estimates, is 111,320,000 barrels, or 3,591,000 barrels daily, allocated among the several producing states as shown by an accompanying table.

Taxes

Tax Appeals Board Rules on Issues in Income Reporting

Issues important in the income reporting of oil companies were dealt with this week by the Board of Tax Appeals in a decision involving $167,000 in deficiencies assessed by the Commissioner of Internal Revenue against American Liberty Oil Company and its wholly-owned subsidiaries, Wofford Production Company and Southern Liberty Oil Company, for 1932, 1933 and 1934.

Six issues were involved in the proceedings, which the board summarized and ruled upon, as follows:

Wofford Production Company acquired an oil and gas lease by the terms of which and an assignment of the lease by the lessee certain amounts were payable to the lessor and lessee solely out of a portion of the assignee's interest in oil and gas produced from the lease. The board held that the amounts derived from the assignee from the sale of oil and gas reserved by the lessor and lessee and paid to them were not taxable income of the assignee.

American Liberty Oil Company in May, 1932, acquired in a non-taxable reorganization, property in Texas on which it subsequently paid state, county and independent school taxes for 1932, and the board held that the amount of the taxes is not deductible from the gross income of the company.

The company sold certain leases and equipment thereon for cash and with a reservation of 4,400,000 barrels of oil when, as, and if produced from the leases, and the board ruled that the method of computing gain or loss on the transaction followed in the Columbia Oil & Gas Company case should be followed. In that case an adjusted basis for the lease equipment was held deductible in full from the cash received.

The company was obliged by provisions of a contract to sell such quantities of oil produced from its leases as a pipe-line company might desire to purchase. The sale of the leases to the Atlantic Oil Producing Company breached the contract, and the liability of the petitioner for damages resulting from its breach of the contract was the subject of negotiations with the pipe-line company from a date prior to the sale in 1934 until April, 1936, when the petitioner agreed to pay the pipe-line company $120,000 for a release of its obligations under the contract. The board ruled that the sum agreed upon as damages for breach of contract is not deductible as an expense incurred in 1934 in connection with the sale of the leases.

Wofford Production Company in 1934 transferred to the petitioner, for a consideration less than fair market value, an oil lease constituting its only operating asset. The petitioner owned all of the subsidiary's stock, and the other assets of the subsidiary consisted of a small amount of cash, an account receivable due from the petitioner, and liabilities of a small amount for taxes. The subsidiary acquired no new assets and conducted no business after the transfer and the petitioner has never paid anything on the indebtedness except about $4600 for income, franchise and other taxes paid for the account of the Wofford company, which continued in existence. The board held that the Wofford company was not in liquidation in 1934 and that the amount of the account receivable was not constructively received by the petitioner in 1934 as a liquidating dividend.

In the same year, Southern Liberty Oil Company also transferred all of its producing properties, having an admitted fair market value of $374,970.81, to the petitioner for a consideration of $177,011.93. The subsidiary continued in existence and paid its franchise taxes and filed income and capital stock tax returns, and the board held that the corporation was not being liquidated in 1934 and the petitioner received in the transfer taxable income, measured by the difference between the fair market value and the recited consideration for the property.

Imports

Buttram Cites Imports in Letter to Humble President

Frank Buttram, president of the Independent Petroleum Association of America, Tulsa, in a letter to H. C. Wiess, president of Humble Oil & Refining Company, Houston, described increasing imports of petroleum as a disturbing economic factor.

His letter follows:

"I have been greatly interested in reading your letter of November 14 addressed 'to those from whom we purchase oil.' This letter goes into a great deal of detail in its discussion of the present economic problems confronting the producer of petroleum, and I have carefully studied the suggestions you have elaborated on therein.

"It is a thorough and frank discussion of some very important questions that must be met by those of us in the petroleum industry who are concerned with its welfare, and I am grateful to you for so well anlyzing these different problems.

"You have well expressed the effect of an uncertain and overburdening production and its relation to the already excessive supply. Without in any way detracting from your splendid analysis of the production problems, I am wondering if you have given any thought to the subject of importation of petroleum and its products from countries outside of the United States.

"This subject has been of great interest and concern to those producers of crude petroleum in the United States who are not so fortunate as to have a large and readily accessible supply of cheaply produced petroleum from countries outside of the United States. This is particularly interesting at this time since during the past year, under the provisions of the trade agreement executed with Venezuela, there has been an alarming increase in petroleum and its products that have been imported into the United States. For the month of October, the last month for which we have official figures, the petroleum imports subject to excise taxes were 144 percent greater than the same petroleum products for October, 1939.

"Since you express so grave an alarm at the unpredictable and fluctuating increases in production of crude petroleum in the state of Texas, I thought perhaps you might have equal concern with those of us who are producing domestic oil, about the unpredictable and fluctuating additions to our supply of petroleum resulting from the importation. I am wondering if your picture of the situation with regard to the supply of petroleum and its products in the United States would have been more complete if you had called attention to those who are adding to this supply by importation as well as those who are adding to supply by production."

Exports of United States Oil to Russia Continue

Shipments of American gasoline to Russia continue. A cargo of motor gasoline cleared from California during the past week for Vladivostok, and early in January another tanker will clear from a California port for the same destination.

Heavy Fuel Stocks Reduced; Gasoline Increment Small

The possibility that the industry may be forced to increase yields of heavy, industrial-grade fuel oils was further emphasized in the latest statistics, covering the week ended December 14. For the second consecutive week, the industry withdrew over 1,250,000 barrels of residual fuel oil from storage, although stocks are moderate in relation to current and prospective demand. The 104,105,000 barrels left on hand at the end of the week compared with 108,219,000 barrels in storage at the corresponding time last year. The present supply is, therefore, 4,000,000 barrels, or nearly 4 percent, smaller than that of a year ago. But demand naturally is running considerably higher, with industrial activity proceeding at record levels, the railroads extremely busy, and fuel requirements for shipping large.

Authoritative figures on demand for heavy fuel oil are available only through October, and in that month both domestic and export requirements were approximately 6 percent larger than a year previously; although the total demand for all oils, domestic and foreign, was up only 2 percent.

The recent large withdrawals from storage indicated that demand for heavy fuel oil has further expanded in November and December.

It has been suggested that this situation constitutes evidence of the desirability of importing more heavy crudes and heavy fuel oils from South America, on the reasoning that manufacture of it from domestic crude would force the making of surplus gasoline and result in prolongation of the depressed state of the gasoline market. On the other hand, consistent opponents of imports continue to maintain that the situation can be satisfactorily met by increasing yields of fuel oils at the refineries, while making compensating reductions in yields of gasoline.

While the heavy-fuel-oil stocks were being reduced sharply, storage of light fuel oil was drawn upon only to a normal or subnormal extent in the week of December 14, having come down from 44,305,000 to 43,935,000 barrels, a withdrawal of 370,000 barrels. The amount left on hand was 8,000,000 barrels larger than that of 36,005,000 barrels held a year before. The 22 percent increment for the year offered promise that scarcity of heating oil would not develop during the winter, despite anticipated record-breaking consumption.

Statistics on gasoline, like those on light fuel oil, were favorable for the week, as stocks were increased only 172,000 barrels, from 81,062,000 to 81,234,000 barrels, a subnormal increment. The latter quantity was only 1700 barrels, or 2.1 percent, in excess of the stocks of 79,534,000 barrels on hand at the corresponding time last year.

In reflection of the curtailment of runs to refinery stills in the previous week, gasoline production was down to 11,298,000 barrels in the week ended December 14 from 11,489,000 barrels in the preceding 7 days, a decrease of 191,000 barrels, which held down the accumulation in storage by that amount.

Slowing down of withdrawals from heavy-fuel-oil storage was foreshadowed for the week of December 21 by the stepping up of refinery runs to 3,495,000 barrels daily in the week ended December 14, from 3,460,000 the week before. At the higher rate, the runs were 2.4 percent above the daily average of December last year. Increased plant operations also indicated that gasoline stocks would be forced up more sharply.

United States crude-oil production averaged 3,578,950 barrels daily in the week ended December 14, the American Petroleum Institute reported. That was 33,650 barrels a day less than output in the previous week and 7.4 percent less than that of 3,865,750 barrels daily in the corresponding week last year.

Refined Oil Prices Advance; Pennsylvania Crude Raised

Continued firmness of the industry's markets has been reflected in further advances of prices of fuel oils, kerosene, range oil, Diesel oil, and lubricants, and in the further 15-cent increase in postings for Pennsylvania-grade crude, following a similar advance about a month ago.

Latest upward revision of prices of light fuel oils and kerosene have been in the primary markets of the Mid-Continent as well as on the Atlantic seaboard, and the increases consequently have reflected inherent market firmness for those products as well as the prevailing record-high domestic tanker rates.

The advance in the postings for Pennsylvania-grade crude reflected current and prospective good demand for lubricants and came directly in consequence of sustained refinery runs of that grade of crude in excess of production. From November 12, when the postings for the region were increased 15 cents a barrel, to December 7, stocks of Pennsylvania-grade crude were reduced about 300,000 barrels, having been lowered to 4,308,000 barrels on the latter date. Refinery runs have been averaging about 70,000 barrels daily, and production was below that rate until lately. The American Petroleum Institute reported that production of Pennsylvania-grade crude averaged 66,650 barrels daily in the week ended December 7, but showed an increase to 73,250 barrels daily for the week ended December 14.

The new posting for Bradford-Allegany crude, effective December 17, is $2.15 a barrel, and Southwest Pennsylvania crude is priced at $1.80, while Pennsylvania grade in Eureka Pipe Line Company lines is $1.74.

A firmer market for crude on the lower Texas Gulf Coast also was evidenced last week when a purchaser rescinded a recent reduced-price schedule. Amsco Pipe Line Company, which had followed the lead of Republic Oil Refining Company in substituting on December 6 a 1-cent instead of a 2-cent differential between gravities, went back to the 2-cent spread in a new schedule issued December 18 but made retro-

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stock (Barrels)	Gasoline Stock (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1938:						
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
1939:						
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[5]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[2]3,650,000	[2]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 30	3,545,000	3,445,000	237,742,000	80,985,000	34,184,000	106,680,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[1]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 28	3,799,950	3,600,000	263,609,000	82,373,000	47,986,000	108,450,000
October 26	3,640,300	3,565,000	262,746,000	80,891,000	[1]48,893,000	108,475,000
November 2	3,479,950	3,535,000	263,820,000	80,774,000	48,615,000	108,199,000
November 9	3,584,200	3,510,000	261,631,000	79,847,000	48,408,000	107,687,000
November 16	3,576,550	3,540,000	261,619,000	80,063,000	48,108,000	107,151,000
November 23	3,765,900	3,510,000	261,723,000	80,100,000	47,511,000	106,871,000
November 30	3,335,050	3,510,000	[2]262,679,000	80,284,000	46,212,000	106,618,000
December 7	3,612,600	3,460,000	261,152,000	81,062,000	44,305,000	105,353,000
December 14, 1940	3,578,950	3,495,000	.....	81,234,000	43,935,000	104,105,000
December 14, 1939	3,865,750	[8]3,414,000	[4]232,016,000	79,534,000	36,005,000	108,219,000
Change in past year	—7.4%	+2.4%	+12.6%	+2.1%	+22.0%	—3.8%

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, December 9, 1939.
[5] Lowest since October, 1922, due to shut down of six mid-Continent states. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] December, 1939, daily average.

Wholesale Prices of Refined Products

REFINED GASOLINE	Range late Last week (Cents a gal.)		Changes from week Before	
Oklahoma Refineries:				
60 Octane and under	3⅜	4¼	...	...
63-66 Octane	4⅛	4⅛	...	...
72-74 Octane	4⅛	5	...	...
Mid-Western Tank Car:				
60 Octane and under	3⅜	4¼	...	...
63-66 Octane	4⅛	4⅛	...	...
72-74 Octane	4⅛	5	...	...
New York Harbor:				
68-70 Octane	5½	5½	...	...
72-74 Octane	5½	6⅝	...	+½
Gulf Coast:				
60 Octane unleaded	3¼	4½	...	...
65 Octane unleaded	3½	4⅝	...	...
72-74 Octane leaded	3½	4¾	...	...
NATURAL GASOLINE				
Grade 26-70:				
F.O.B. Group 3	2¼	2¼	...	...
F.O.B. Breckenridge, Tex. 2		2	...	...
KEROSENE				
Oklahoma Refineries:				
41-43 water white	3⅞	4⅛	...	+⅛
42-44 water white	4	4¼	...	+⅛
Mid-Western Tank Car:				
41-43 water white	4	4¼	+⅛	+¼
42-44 water white	4	4⅛	...	...
New York Harbor	5½	5½	+⅛	...
RANGE OIL				
At Oklahoma Refineries	3¾	3⅞	...	+⅛
In Mid-Western Market, Group 3, basis	3¾	3⅞	...	+⅛
LIGHT FUEL OILS				
Oklahoma Refineries:				
No. 1 straw	3½	3¾	...	+⅛
No. 3	3⅜	3½	...	...
Mid-Western Tank Car:				
No. 1 white	3¾	4	+¼	+⅛
No. 3	3¼	3½	...	...
New York Harbor:				
No. 1	5½	5½	+¼	...
No. 3	4⅞	4⅞	+⅛	+⅛

HEAVY FUEL OILS	Range late Last week (Per Bbl.)		Changes from week Before	
Oklahoma Refineries:				
No. 6	$0.60	$0.60	...	...
Mid-Western Tank Car:				
No. 5	.75	.85	...	...
No. 6	.55	.60	...	...
New York Harbor:				
No. 5	1.45	1.55	...	...
No. 6	1.15	1.25	...	...
BUNKER C FUEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$ .80	$ .90	...	...
New York Harbor	1.15	1.25	...	...
DIESEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$1.50	$1.70	...	...
New York Harbor	2.00	2.00	+.05	+.05
Los Angeles Basin, 27 gravity	1.15	1.35	...	...
LUBRICATING OIL (Cents a gal.)				
Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	13	15½	+½	+½
Neutral oil, pale No. 3 color, 150 viscosity at 100°, 0-10 pour test	8	10¼	...	...
Western Pennsylvania:				
Bright Stock, 145-155 viscosity at 210°, 25 pour test	12	13	...	...
Neutral Oil No. 3 color, 150 viscosity at 70°, 25 pour test	19	20	...	...

active to December 6. The new schedule is the same as that which has been maintained by major purchasers, ranging from 91 cents for below 20 gravity, by 2-cent differential for each degree, to $1.09 for 28-gravity and above. In the December 6 schedule the range had been from 92 cents for below 20 gravity, by 2-cent differential, to $1.01 for 28-28.9 gravity.

Strengthening for the markets generally last week were the forecasts of demand for January and for 1941 released by the Bureau of Mines and the statement by H. F. Sinclair, head of Consolidated Oil Corporation. The Bureau's report predicted that domestic demand for all oils in 1941 would be up 8 percent, and that the overall gain would be 6 percent, despite further loss of export business. Distributing implications were embodied, however, in the agency's warning that residual-fuel-oil stocks appear inadequate; for it is possible that expansion of the inventories of the heavy oils may entail a resultant overproduction of gasoline and other products, demand for which likely will be up to relatively less extent.

Sinclair's statement, commenting on the outlook for 1941, expressed the view that stocks of broth crude oil and gasoline were moderate in relation to requirements, and that crude stocks were too small rather than too large.

Light fuel oils continued in strong demand last week in most districts. Some Oklahoma refiners advanced their quotations ⅛-cent a gallon on all grades of burning oils and kerosene. Shipments against contracts were large, and supplies were scarce.

Some further advances of ⅛ to ¼ cent a gallon for light fuel oils and kerosene were made also on the Atlantic coast.

In the Appalachian refinery district, some refiners advanced quotations on kerosene and fuel oils ⅛ to ¾ cents a gallon, following the crude-price advance, and lubricants were raised ½ to 1 cent.

On the Atlantic coast, Diesel oil for ships was quoted generally 5 cents a barrel higher last week.

United States Crude Oil Production Moderately Higher

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Dec.)	State Allowable (Barrels Daily in Dec.)	BARRELS DAILY FOR WEEK ENDED Dec. 14	Dec. 21
TEXAS—				
Texas Panhandle	.....	.....	77,100	82,900
North Texas	.....	.....	107,200	106,400
West Central Texas	.....	.....	30,800	30,700
West Texas	.....	.....	217,900	220,100
East Central Texas	.....	.....	80,800	82,900
East Texas Field	.....	.....	347,700	374,800
South Texas	.....	.....	198,600	196,300
Texas Gulf Coast	.....	.....	242,700	247,600
Total Texas	**1,277,000**	**1,316,657***	**1,329,800**	**1,341,700**
CALIFORNIA—				
Long Beach	.....	.....	41,400	41,400
Midway-Sunset	.....	.....	43,800	54,900
Kettleman Hills	.....	.....	38,900	38,000
Wilmington	.....	.....	83,000	82,400
Others	.....	.....	409,500	404,200
Total California	**593,900**	**571,000†**	**616,600**	**620,900**
OKLAHOMA—				
Oklahoma City	.....	.....	80,100	87,850
Seminole Area	.....	.....	100,225	100,050
Others	.....	.....	204,125	203,975
Total Oklahoma	**422,600**	**390,000**	**384,450**	**391,875**
ILLINOIS—				
Salem	.....	.....	117,700	117,100
Louden	.....	.....	67,500	70,200
Centralia	.....	.....	16,500	15,200
Other New Pools	.....	.....	116,800	108,800
Old Pools	.....	.....	10,300	10,900
Total Illinois	**363,600**	.....	**328,800**	**322,200**

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Dec.)	State Allowable (Barrels Daily in Dec.)	BARRELS DAILY FOR WEEK ENDED Dec. 14	Dec. 21
LOUISIANA—				
North Louisiana	.....	.....	68,400	68,600
South Louisiana	.....	.....	218,500	220,800
Total Louisiana	**280,300**	**287,246**	**286,900**	**289,400**
KANSAS	**188,400**	**192,400**	**199,050**	**199,700**
NEW MEXICO	**100,600**	**104,000**	**101,200**	**101,500**
EASTERN STATES—				
Pennsylvania Grade	47,900	.....	66,800	72,600
Others, Eastern	43,000	.....	20,100	20,300
Total Eastern States	**90,900**	.....	**86,900**	**92,900**
MOUNTAIN STATES—				
Wyoming	74,500	.....	71,800	69,500
Montana	19,700	.....	18,100	18,200
Colorado	3,900	.....	3,500	3,500
Total Mountain States	**98,100**	.....	**93,400**	**91,200**
MICHIGAN	**47,100**	**44,000‡**	**45,400**	**43,600**
ARKANSAS	**66,100**	**70,176**	**69,100**	**68,800**
INDIANA	**15,500**	.....	**21,100**	**19,700**
MISSISSIPPI	**13,900**	.....	**13,500**	**16,500**
NEBRASKA	**2,000**	.....	**2,450**	**2,900**
§Total 8 Prorated States	**2,976,000**	**2,975,479**	**3,032,500**	**3,057,475**
Total United States	**3,560,000**	.....	**3,578,650**	**3,602,875**

*** Estimated net basic daily allowables as of December 1. Railroad Commission estimates that actual production normally is about 3 percent under the new allowable. But allowable normally increases as new wells are completed. Under December order, most Texas fields were ordered shut down December 1, 7, 8, 14, 15, 22, 25 and 31.**

† Recommendation of Conservation Committee of California Oil Producers.

‡ Estimate of actual production under prescribed regulations, which do not fix a definite state total allowable.

§ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.

U. S. FIELD OPERATIONS

Kansas

Reagan Sand May Provide Rush County Oil Pool

Patton Drilling Company and Lion Oil & Refining Company's Werth 1, C W½ SW SE 10-16-19w, northern Rush County, 6 miles southwest of Madden pool and 7 miles southeast of Penny-Wann pool, southern Ellis County, indicated a Reagan-sand strike. Pay was topped at 3712 feet, and saturation cored at 3716 feet. Casing was cemented at 3712 feet for testing.

Between Bloomer and Stumps pools, Ellsworth County, Skelly Oil Company's Smith 1, CSL SE NW 32-17-10w, semi-wildcat, recorded a pumping potential of 428 barrels in 24 hours from Arbuckle lime at 3230-44 feet.

Braden & McClure et al's Phillip 1, C N½ NW SE 34-15-11w, Russell County, filled 2200 feet with high-gravity crude in 10 hours. The strike is 1½ miles north of Davidson pool, and designated temporarily as North Davidson. Gorham sand was topped at 3307 feet, and when penetrated 2 feet, hole filled 700 feet with oil in ½ hour. On deepening to 3313 feet, a larger fill-up occurred, and 5½-inch casing was cemented at 3307 feet. Tankage has been erected for a potential test.

Shallow water pool, Scott County, was extended ½ mile north by Atlantic Refining Company et al's Hamlin 1, C W½ SW SW 11-20-33w, which filled 3500 feet of 28-gravity crude in 3 hours after drilling plugs. Mississippi lime was logged at 4587-4670 feet, and 5½-inch casing set at 4649 feet. No water was present. A natural producer is expected.

Lewis & Dunn have a small wildcat discovery in Greenwood County at Keller 1, C E½ NE SW 22-26-13e, between Brinegar and Toronto pools. From Bartlesville sand at 1473-78 feet, hole filled with oil in 20 minutes after drilling in plugs, and on a 24-hour test it flowed 48 barrels of 32.5-gravity crude.

New Wildcat Activity

In Brown County, McAlpine et al set surface pipe at Tyler 1, NE SW SW 4-3s-15e, 2 miles south of Fairview.

Earl Wakefield staked location for Holland 1, C E½ NE SE 30-13-13w, 3½ miles east of Russell pool and same distance northeast of Gurney pool, Russell County.

Southeast of abandoned Victoria pool, Ellis County, Guido Piggott et al were drilling with rotary at Kuhn 1, C N½ NE NW 17-14-16w.

Schultz et al drilled to 1260 feet at Davis 1, C S½ SW NW 28-18-18e, Franklin County. C. E. Ash et al spudded Taylor 1-B, in NW NE NW 7-27-12e, 3 miles east of Climax pool, Greenwood County.

Olson Oil Company set 1875 feet of 6-inch surface pipe at Macredic 1, C N½ NE NE 15-29-2w, 3½ miles south of Derby gas pool, Sedgwick County.

Black-Marshall Oil Company had cellar and pits at Weber 1-B, C W½ SW SW 12-16-12w, Felts area of Barton County. Hannum Drilling Company was making hole with rotary at Skolaut 1, NWc NE 27-18-15w, in the Otis gas pool. W. P. Hilderbrand staked Maneth 1, C E½ SE SW 2-19-14w, 2½ miles northeast of Heizer pool, Barton County.

In Graham County, Cities Service Oil Company was moving in material for Kuehnel 1, NE SW SW 34-9-21w, 2¾ miles south of Morel pool.

Wildcat Failures

Rooks County recorded two dry holes. Cities Service Oil Company's Johnston 1, SWc NE 5-6-19w, 6 miles east of Ray pool, was plugged at 3670 feet. Log gave Topeka topped at 2990 feet, Lansing 3300 feet, Base Kansas City 3448 feet, Erosional Arbuckle 3518 feet, Arbuckle 3589 feet and Granite at 3669 feet. Atlantic Refining Company and Helmerich & Payne, Inc., et al's Baumgarten 1, C E½ SE NW 25-9-19w, 6 miles north of Zurich pool and 8 miles southeast of Veverka pool, topped Arbuckle lime at 3676 feet for a small show of oil in upper cores, but had water at 3700 feet, total depth.

Six miles south of Hartsook pool, Ellis County, and south of abandoned Victoria pool, Central Petroleum Company et al had a dry hole at Wellbrook 1, NWc NE 32-14-16w. Arbuckle lime was encountered at 3433 feet, but water entered hole at 3452 feet, and it was plugged.

Continental Oil Company plugged Karst 1, NW NE NW 12-16-15w, 3 miles southeast of Boxberger pool, Barton County, at 3421 feet in Arbuckle lime, topped at 3413 feet. Upper log disclosed Lansing lime at 3159 feet with a small show of oil at 3256-62 feet, Sooy Conglomerate 3397 feet, while electric log indicated shows at 3250-60 feet in Lansing lime.

Four miles north of Great Bend, W. O. Allen et al's Benjamin 1, C W½ SW SE 3-19-13w, was plugged in Arbuckle lime at 3449-85 feet. Topeka lime was logged at 2850 feet, Lansing 3205 feet, Sooy 3434 feet, and a very small showing of oil at 3457-69 feet in a 7-foot core recovery.

Marylyn Oil Company abandoned Jackson 1, C E½ NE NW 1-27-13w, 1¼ miles northeast of Iuka pool, Pratt County, at 4342 feet in Arbuckle lime. Simpson sand was topped at 4201 feet, and Arbuckle lime at 4315 feet. Plugging back to 4337 feet, a 50-quart shot at 4230-37 feet failed to bring in a commercial producer after early indications looked favorable.

Oklahoma

Pawnee County Wildcat Yields 250 Barrels From Wilcox

Alma Oil Company, Oklahoma City, had a Wilcox-sand discovery in Pawnee County at Hill 1-A, C N½ NW SW 1-21n-5e, 5 miles west of Skedee pool and on a spotted production trend in a northwest-southeast direction toward Pawnee. Wilcox sand was topped at 3363 feet, and pay drilled in seven feet. Electric log showed favorable, and pipe was cemented below Mississippi lime topped at 3145 feet. On test, flow gauged 250 barrels of 40-gravity crude, and approximately 200 barrels of water. Fluid was believed coming from behind pipe in the Mississippi lime, and a shut-off will be attempted. Tankage has been erected for a production run. Location is on a block of 1000 acres, with Stanolind Oil & Gas Company holding considerable acreage in this area. An old exhausted producer was drilled ½-mile east of this strike.

Peters Petroleum Company and Norbla Drilling Company completed initial Arbuckle-lime producer on a Bartlesville sand pimple in Page District, Osage County, and ½-mile east of Shell Creek Lake, at Osage 2-83, SWc NE 29-20n-11e. Arbuckle lime at 2433-34 feet was acidized with 2000 gallons, after topping formation at 2426 feet and drilling to 2435 feet. Five-inch casing was set at 2426 feet. On a 3-hour test, flow gauged 60 barrels natural and will rate a 480-barrel potential per day. Crude is 36-gravity corrected.

Peters Petroleum Company and Berry Brothers have staked location for a west offset to their Mississippi-lime strike, Osage 5, SE SE NW NW 14-22n-10e, which flowed 1680 barrels in 24 hours, but later was pinched in to 100 barrels per day. New location is in NEc 15-22n-10e.

Brookhaven Oil Company et al's Osage 1, NEc SW 6-22n-8e, south of Gilliland pool, was a failure in Arbuckle lime and plugged. Topped at 3040 feet, lime showed some oil in upper portion, but when 57 feet in, it filled with water. Hole was carried to 3110 feet.

The Texas Company opened the third and fourth productive zones in the 3-well North Okemah pool, Okfuskee County, at Randles 1, NE NW NW 8-11n-10e, a southeast offset to the discovery. When drilled to 3735 feet in Hunton lime, topped at 3690 feet, water entered hole some 900 feet up. With 7-inch pipe cemented at 3685 feet, cement plug was set at 3650 feet and pipe perforated with 20 shots at 3180-3200 feet in the Wapanucka and Upper Cromwell horizons, logged respectively at 3184 and 3193 feet. In 24 hours, it flowed 25 barrels with 1,000,000 feet of gas. The discovery well rated 474 barrels of high-gravity crude from Hunton lime while the second well, a southwest offset, made a 4,300,000-foot gasser in Gilcrease sand.

Outlook from Cromwell-sand production north of Dill pool, Okfuskee County, should be indicated by Keener Oil & Gas Company et al's McKernan 1, NWc NE 26-12n-9e, 1¼ miles north of Dill and south of East Cromwell pool. Sand and shale was topped at 3684 feet, and core at 3684-89 feet recovered good oil staining. Operators were coring ahead, below 3730 feet, not yet to Cromwell pay, and check-

ing structurally lower than north producers in Dill pool proper.

North of Okemah, Selden Henry, Jack Harvey et al were bailing down fluid column at Dudgeon 1, NE SW SE 36-12n-9e, in Cromwell sand at 3289 feet, topped at 3284 feet. In core at 3281-89 feet, recovery disclosed 3 feet of lime and a foot of sand with a show of oil in two additional feet of limy sand. Best showing was in Gilcrease sand at 3080-05 feet. Portable Drilling Company's Nelson 1-A, NE SE SW 1-11n-9e, wildcat in the area, drilled plugs in Cromwell sand at 3336 feet after cementing 5½-inch casing at 3323 feet. Water rose from a poor cement job, but it was overcome with a squeeze job.

Indiana

Wildcat on Illinois Side of Wabash Indicates Production

A. L. Cochran et al's Hattie Golden 1, SW SE NE 29-5s-14w, White County, Illinois, wildcat about two miles south of Superior Oil Company's Ribeyre Island production in Posey County, Indiana, set casing to test Waltersburg sand saturation at 2266-88 feet, which on a drill-stem test showed 400 feet of oil and drilling mud and no water in 12 minutes. The test looms as a pool-opener rather than an extension, since the Ribeyre Island field has been at least partially defined by a dry hole to the southeast, Superior Oil Company's Stum 1, Section 15. Moreover, the Waltersburg on the island comes in around 2200 feet.

Four miles south of Golden 1, in Posey County Illinois Production Corporation's Jon Larkin 1, NE NE SW 17-6s-14w, was through the St. Louis, topped at 2984 feet. Hole was abandoned at 3005 feet. Slight shows in the Pennsylvanian and Tar Springs sands did not show commercial on electrical log test.

Also disappointing was L. F. Boone's Sand Island 1, approximately SW NW NE 16-7s-13w, Ohio River wildcat just upstream from Mt. Vernon, Indiana. Test flowed clear salt water when plug was drilled in Upper Ohara at 2630-42 feet. The test will cement again and deepen for other possible pays in the Ste. Genevieve or in the St. Louis.

In Daviess County, Reeve Township, Newton Pipeline Company's W. G. Brittain 1, NE NE SW 16-1n-5w, wildcat inactive for several weeks after drilling through Devonian, was drilling at about 3115 feet, looking for a break in the Trenton.

In the Griffin field, Continental Oil Company completed Bozeman Land Company 18, NE SE NE 23-3s-14w, in the Cypress sand for an initial of 225 barrels a day on pump without shooting. Hole was bottomed at 2533 feet, and pay interval was at 2501-33 feet.

Temporarily abandoned after testing Cypress was A. A. Bareuther's Hollingsworth 1, N½ SW SE 13-2s-10w, in the old West Francisco field of east Gibson County.

Increase Turtle Bay Allowable 285 Barrels

The Texas Railroad Commission has entered an order, effective December 15, increasing the allowable for the Turtle Bay field, Chambers County, 285 barrels, from 1366 to 1649 barrels daily.

Forest City Basin

Two More Wells for Falls City; Snow Slows Activity

Field activity in the Falls City area of Richardson County, Nebraska, were slowed with over a foot of snow on the ground. Two completions were recorded. The Ohio Oil Company's Bucholtz 3, SE NW SW 17-1n-16e, topped Hunton lime at 2208 feet and bottomed at 2225 feet. After treatment with 1000 gallons of acid, flow averaged 20 barrels per hour for 8 hours, to establish a 480-barrel potential. R. L. Campbell et al's Schock 3, C S½ NE SE 20-1n-16e, pumped 576 barrels in 24 hours. Pay was logged at 2260-63 feet and treated with 500 gallons of acid.

South end of production was indicated by Skelly Oil Company's Prichard 1, C SE NE 29-1n-16e, dry in Hunton lime at 2365-2401 feet.

Taylor Drilling Company et al's Wamsley 1, C SW NW 8-1n-16e, ¾ mile north of production in Falls City, was attempting to cement off water instrusion after a good show of oil in Hunton lime. It was swabbing 2 barrels of oil 18 barrels of water per hour.

A mile north of Shubert pool, Richardson County, I. T. I. O. Company plugged Ege 1, C NE SE 19-3n-16e, as a Hunton-lime failure around 2475 feet. W. H. Martgan et al's Smith 1, C E½ NW NW 31-3n-16e, 1¼ miles west of Shubert pool, was rotating below 2300 feet.

New Activity

Walters et al's Bodie 1, NW NE NE NE 12-1n-9e, Pawnee County, had derrick and rotary rig on location for a wildcat test.

In Richardson County, Powers & Stalder et al's Lee 1, NE NW NE 16-1n-14e, between two dry holes on a northeast-southwest trend from Falls City, drilled surface hole.

Skelly Oil Company was drilling with rotary at Walraff 4, SE NE SW 20-1n-16e, in Falls City pool.

Wildcat Failures

E. V. Jackson and Fred Rust plugged Shaffer 1, C SE SE 19-4n-16e, 11 miles southeast of Auburn, Nemaha County, at 2587 feet in dry Hunton lime, topped at 2548 feet.

Eckhart et al's Ast 1, SWc NW 6-1n-14e, 2 miles northwest of Ogle pool, Richardson County, was abandoned at 2310 feet. Hunton lime was encountered at 2301 feet.

Frank Engles et al's Wheeler 1, NEc 9-4n-14e, 6 miles southeast of Auburn, was shut down for orders at 2668 feet in Hunton lime. Log disclosed Lansing lime topped at 1035 feet, and Hunton lime at 2658 feet. Hole filled with water in sand at 2130-70 feet.

Ask 10-Acre Spacing for New Pecos County Area

Ten-acre spacing for wells around the Davis & White's Ed Fromme 1, Pecos County, was requested at a hearing before the Texas Railroad Commission last week. Operators also asked that the wells bs given an allowable of 100 barrels, on a per-well basis.

Production is found at 1888 feet in the well completed November 11, about 400 feet deeper than the normal producing horizon in this area. While the formation has been located in the Shearer field, about ¼ mile west, it is dry there.

The new well is in Section 110, Block 10, H&GN Railway Survey, Pecos County. No other rules were requested.

Oil Strike Indicated for Shackelford County District

An oil strike for the Cook Ranch district, Shackelford County, was indicated late last week when Roeser & Pendleton, Inc. and Continental Oil Company's Cook 1-A-118, C SE SW E. T. Section 118, Block 1, began filling with oil from Lower Hope sand at 1697-1700 feet, with an elevation of 1811 feet. It will be given pumping test with spudder, then deepened if the small volume of water appearing with the oil can be exhausted. Seven-inch pipe is cemented at 1559 feet. This prospect is 2 miles from production.

Danciger Oil & Refineries, Inc.'s Kelso 1, Flippen-sand strike for the Stith area, Jones County, filled 1200 feet with oil to assure a commercial well after drilling plugs from 7-inch pipe at 2335 feet and deepening the hole to 2339 feet. It is to be given a swabbing test to try for a natural flow. The company holds lease on 785 acres in the immediate area.

Texas Hearings

The Texas Railroad Commission has scheduled three hearings for January 3 at Austin.

It will hear applications for allowable increases for the Eaves Field, Winkler County, the Manvel Field, Brazoria County, and for Radford Grocery Company's Fee 1, in the Griffin field, Jones County.

On January 6, the commission will hear applications for allowable increases for the Flag Lake field and the Rowe and Baker field, Henderson County.

A hearing on revision of operating rules for wells drilled to the Frio sand in the Saxet field, Nueces County, has been recessed from December 20, to January 6.

Texas Commission Grants Increase to 12 Fields

The Texas Railroad Commission last week revised its state-wide proration order as a result of an emergency hearing held December 11.

Cuts were ordered for the following fields producing high-gravity crude: East White Point was reduced 1064 barrels to 9776; La Rosa was reduced 884 barrels to 2965, and Plymouth was reduced 904 barrels to 8272 barrels.

The cuts, however, which totaled 2812 barrels, were more than offset by increases totaling 6363 barrels. Angleton was exempt from shut-downs December 20, and Old West Columbia was exempt from shut-down orders effective January 1. Allowable increases were granted to 10 other fields, and they become effective December 20. The comparative allowables for December 14 and December 20 are shown in the following table:

Field	Dec. 14	Dec. 20	Increase
Bay City	2,676	3,063	387
South Esperson	1,146	1,440	284
Hamman	1,920	3,099	1,179
League City	2,241	2,430	189
South Houston	2,801	3,588	787
Baldwin	255	315	60
Sewell	770	1,100	330
Rogers (Young)	132	600	468
North Cowden	12,926	14,648	1,722
Fargo	275	375	100
Angleton	671	945	274
Old West Columbia	1,426	2,009	583
Total			5,363

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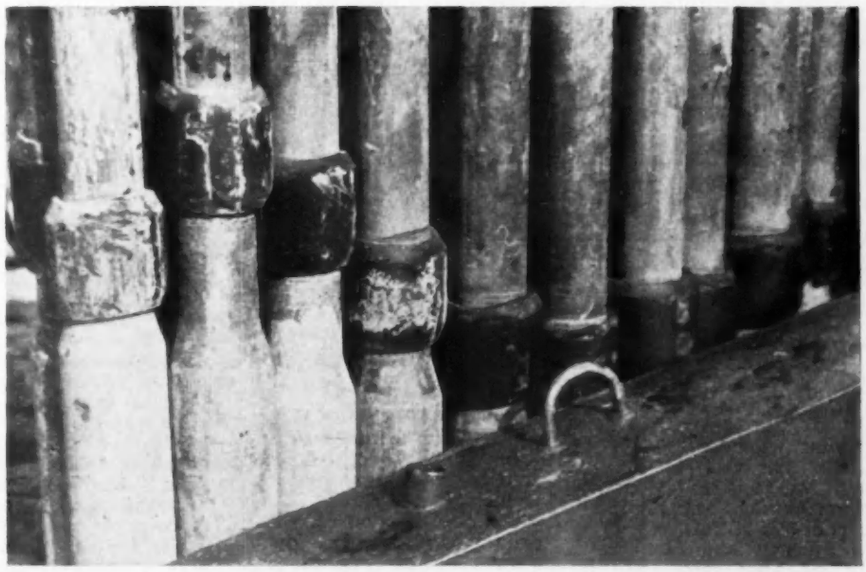
(10,000-footers)

In a study of a group of very deep wells in the Gulf area, 83 wells drilled to a total of 962,000 feet (including whipstocking footage) Patterson-Ballagh Protectors averaged more than 5 wells per string. The cost was considerably less than 4c per foot of drilling. There was not a single case of casing trouble, no water leaks, not a single fishing job in the casing, nor any instance of a "washout" in the casing. These are not wells selected because of their trouble-free record, but the deep wells in this district from which records could be obtained. Only one is less than 10,000 feet. Most of them are 13,000 feet deep. It's *Economy Insurance* to use these Protectors.



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East Texas

Wood County Apparently Has A Van-Type Oil Field

Hawkins dome in southeastern Wood County will fulfill its threat of two months standing to become the next active drilling center in East Texas as result of the recovery of a thick section of Woodbine carrying oil and gas by a wildcat on a five-acre lease within the hamlet of Hawkins. The pending completion involves F. R. Jackson and S. J. Rotundi's Cobb 1, which has apparently established the presence of a Van-field type of producing area in checking 400 to 500 feet higher on key geological markers than Bobby Manziels et al's Morrison 1, located 3¼ miles to the northwest and on the northwest flank of the uplift. The latter recently produced 20 barrels of fluid hourly averaging 15 percent low-gravity oil with temporary pumping equipment after plugging back from bottom-hole water to 4917 feet to perforate casing opposite Woodbine saturation at 4909-16 feet.

The townsite test logged first red beds in the Woodbine at 4365 feet with an elevation of 400 feet. White gas sand prevailed at 4460-90 feet followed by a 5-foot section of fine-grained sand and shale with good oil odor. Rotary cutting from section at 4507-75 feet yielded fine-grained sand with shale breaks carrying good odor and taste of oil. Broken sand and shale continued in drilling to the 4600-foot level. The test is due to be carried to about 4800 feet before running casing for a production test.

Top of Austin chalk was called between 4075-4116 feet and base between 4176-91 feet according to sample analysis. This unusually high structural position carried threat of entering salt before reaching the Woodbine as the county has a shallow salt plug in the Haynesville sector. The latter plug was uncovered at 1228-61 feet in December, 1929, by Gulf Production Company's Stewart 1, Wesley Tollet survey, with an elevation of 400 feet.

The Hawkins test is 15 miles west by north of the Gladewater sector of the East Texas field. Humble Oil & Refining Company controls the bulk of the prospective producing acreage having started accumulating in 1935. However, numerous small tracts and sites have been ferreted out by independents within the company's block and more than a dozen applications for drilling permits have been filed with the commission.

Manziel et al have started a second test involving Lee Bell 1, Edwin Wideman Survey, a mile northwest of the town. The latter is on a 31.7-acre lease.

Hawkins dome apparently dips sharply to the southeast as Alex Anyder et al's Holmes 1, A. N. McKnight Survey, 1¾ miles southeast of the townsite test, logged top of Austin chalk at 4776 feet and top of Woodbine at 5135 feet with an elevation of 338 feet, and abandoned at 5330 feet in November, 1934.

North Texas

Closely Watched Ordovician Test Drilling Hard Lime

Logging of gas shows in two horizons by Culbertson & Irwin, Inc.'s Heiner 1, C NE NE GC&SF Section 589, Pecos County Ordovician prospect for the Byrne shallow area, has resulted in close check being maintained by operators on the progress of the test. It was drilling hard lime at 4830 feet, having passed up gas in unidentified lime section at 4528-45 feet and 4625-28 feet, with an elevation of 2549 feet. It is nine miles west by south of the Apco deep pool.

Large quotas of wildcat and semi-wildcat failures were recorded in West Texas the past week. In Ector County, Forest Development Corporation's Bradley 2, SWc T&P Section 18, Block 43, T-3-S, encountered water in drilling to 4394 feet. It proved to be considerably lower on structure than the company's recent 77-barrel pumping discovery in the southeast corner of the same section. The company has made location for W. P. Edwards 1-B, 1½ miles south by west of the discovery.

Phillips Petroleum Company's Cowden-Embar 1-125, C SE SE T&P Section 6, Block 44, mile southwest of the company's Embar ranch wildcat gasser, was abandoned at 2500 feet due to low structural position. A previous test of an 8-well program was abandoned at shallow depth because of low markers. The company's Cowden-Embar 2, 4800 feet southeast of the gasser, missed the pay, and was drilling at 4510 feet, with an elevation of 3233 feet. University-Andrews 1, 1¼ miles northeast outpost, was drilling at 4230 feet, having cemented oil string near the 4000-foot level.

In Terry County, Sloan & Zook Company's Bailey 1, C NW NW C&M Section 103, Block 4-X, encountered sulphur water in fulfilling depth contract at 4805 feet. No shows were reported. Denver Producing & Refining Company's Lewis 1, SEc Section 62, Block DD, was drilling at 5180 feet. Top of brown lime was called at 4460 feet, with an elevation of 3302 feet. Gulf Oil Corporation's Mallet 4, 2½ miles west of the south end of the Slaughter field, was drilling at 5885 feet with an elevation of 3544 feet, and is try for production in the Clear Fork, or Holt pay.

Plugging orders were issued for Humble Oil & Refining Company's Matador 1-C, C SE SE GB&CN Section 29, Block JB, Motley County, after drilling to 7430 feet. This is the third failure for the company since launching explorations on its Matador Land & Cattle Company 466,526-acre lease taken early in 1938. A second test for Dickens County portion of the ranch is to be drilled in Block 1, Shock & Arnold Survey. The company purchased leases last October to the northwest of its original Matador test, which was abandoned at 7053 feet after perforating pipe at several levels in the Lower Permian.

Amon G. Carter et al's Willard 4-D, projected Ordovician test for the Gaines County sector of the Wasson field, was drilling at 9170 feet, having encountered extremely hard formation below the 9000-foot level. Operations on Wasson 5-D, 1760 feet south, have been idle the past month at 6881 feet. Continuous drilling obligation was assumed by Dan Danvers et al in accepting lease farmout from The Oil Development Company of Texas on the north 320 acres of Section 737, a short distance north and east of production in the Yoakum County sector of the Wasson field.

Assignment of an allowable quota of 150 barrels daily to Gulf Oil Corporation's Wristen Bros. 5, recent deep strike for the Shipley pool, Ward County, and the first in Texas to produce from the Silurian limestone, will provide sufficient drainage over a period of months to test the ability of the well to maintain its flow. Owners of leases bordering the discovery site may elect to study the performance of the well before launching development. Wristen Bros. 5 earned a potential of 3049 barrels of 34.8-gravity oil at 98 degrees temperature, or 32.2-gravity corrected, after acidizing pay section at 7010-60 feet, with gas/oil ratio of 1148/1. When shut in for pipe-line connection, pressures built up to 2900 pounds on casing and 2585 pounds on tubing. The oil contains comparatively little gasoline, and is unusual for the district in that it congeals when exposed to temperatures below 75 degrees Fahrenheit.

Humble Oil & Refining Company's Tubb 46-X, third Ellenburger test for the southeast extension sector of the Sand Hills field, succeeded in shutting off water in plugging back from 5794 to 5780 feet. The well filled with 4500 feet of oil after swabbing, and will be acidized. Top of Ellenburger was called at 5762 feet, or 3203 feet subsea, and first saturation at 5767 feet. Gulf Oil Corporation's Waddell 14, most northeasterly producer in the Sand Hills regular Permian zone, earned a potential of 7709 barrels of 36½-gravity oil and 3,900,000 feet of gas after using 5000 gallons of acid at 4370-4524 feet. The latter is building road for delivery of rotary rig to drill Waddell 17, C E¼ of E¼ H&TC Section 15,, Block 3, and will be prepared to test the Ordovician. It is 4½ miles south of the Sand Hills area and on a strike with the Abell and Apco pools, northern Pecos County.

Confronted with short-term leases, Magnolia Petroleum Company has authorized its third test for the Abell pool, which produces from Simpson sand near the 5300-foot level. Northeast extension will be sought in drilling F. G. Baldwin 1, southeast corner of Lot 11, H&GN Section 24, Block 9, being northeast of a failure on the McKee tract that indicated production possibilities in the Simpson when drilled to 6267 feet in July, 1938. The company's Sharp-State 1 and Markey 1 were drilling at 1050 feet and 2900 feet, respectively. Other lease owners are faced with early development to forestall lease expirations.

Hearing Postponed

The Texas Railroad Commission has postponed indefinitely a hearing scheduled for December 16 to fix operating rules for the area surrounding British American Oil Producing Company's Claude Cowan 1, in Section 198, T&NO Survey, Baylor County. The company asked for the delay.

West Texas

Jack County Wildcat Flows 102 Barrels From Deep Zone

Natural flow of 102 barrels of 46-gravity oil initial, recorded by Continental Oil Company's Robertson 1, M. J. Swan Survey, 7 miles southwest of Jacksboro, opened a deep area for Jack County. Production is from saturation in the Mississippian at 5350-60 feet, and possibly from Ellenburger, which was topped near the 5375-foot level and drilled to 5386 feet. The initial gauge was taken through tubing chokes, ranging from ¼ to 1-inch, and gas/oil ratio was placed at 1500/1. It is the first producer for the county in either of the formations. The well was treated with 1000 gallons of acid later in the week, but failed to flow due to clogged tubing.

Rathke Oil Company and R. C. Parker's Mosely 1, John Harrison Survey and in the Joplin area, Jack County, was fishing tools at 5055 feet, having passed up small flow of wet gas at 4745-50 feet, and was due to deepen to the Mississippian.

Two Montague County deep prospects proved disappointing the past week. Benson & Benson's Joe Benton 1, A. A. Lewis Survey, 2 miles southeast of production in the Ringgold pool, passed up conglomerate stained with oil at 5750-55 feet in Bend, topped at 5718 feet, and was coring at 5805 feet. On the Bend marker, it is about 82 feet lower than the nearest Ringgold test. The Lower Bend is the next potential producing horizon. J. G. Hammond, Inc.'s Jester 1, 1½ miles west of Mallard, yielded rotary mud on drill-stem test at 6392-6406 feet in Bend, topped at 6282 feet. Coring was resumed, as it is contracted to drill to 8500 feet, or water in the Ellenburger. Top of Bend is 370 feet higher than the same marker on Seitz, Comegys & Seitz, Inc.'s Harris 1, a recent 6939-foot failure 9 miles to the east. Tom Hunter et al's Fatheree 1, Montague County 5000-foot project and 2 miles west of Illinois Bend, was drilling sandy shale at 4990 feet.

Featherston, Spragins & Art's Green 1, ½-mile southeast outpost for the Rendham pool, Baylor County, entered the Canyon at 3047 feet with oil saturation logged to 3051 feet. It is about 10 feet higher than the pool's two producers, and 5½-inch pipe has been cemented at 3047 feet to complete.

Revival of drilling in the west trend of production from the Rogers & Rogers pool, Montague County, is likely to follow completion of Carnation Petroleum Company's Baker 1, NEc SW block 42, which tested 5128 feet of oil on 30-minute drill stem test at 5297-5306 feet. Pipe has been run to complete, with the hole bottomed in Ellenburger at 5345-96 feet. Top of Bend was called at 5203 feet, with first conglomerate saturation at 5236-65 feet and main conglomeration pay at 5297-5306 feet. It is a south offset to W. T. Payne et al's Baker 1, which expanded the deep pay one mile west by north last April. However, Stanolind Oil & Gas Company's Hill 1, east of offset to the latter, proved dry in the Bend and Ordovician, but made a small flowing well in the Lower Strawn at 4572-98 feet.

Sinclair Prairie Oil Company has authorized drilling of J. P. Clingingsmith 1, SWc Block 149, Belcher subdivision of J. Olaberry Survey, A. 579, projected 6500-foot wildcat. It is 3½ miles south of the Rogers and Rogers pool, and is due to encounter the Strawn and Bend series considerably lower since these formations dip sharply on the south edge of the pool.

The sixteenth oil producer for the Bonita pool, Montague County, involves Sinclair Prairie Oil Company's West Bonita Unit 2, which earned a potential rating of 1504 barrels from Bend conglomerate at 5297-5303 and 5440-55 feet, with 7-inch pipe cemented at 5274 feet. It is the first to complete in the upper and lower pays. The area has seven flowing wells in the 5200-foot zone, and eight producers in the 5400-foot zone, besides the above well. Seven-inch pipe is cemented at 5442 feet to test Southeast Bonita Unit 1 at 5459 feet.

Southern Petroleum Exploration, Inc.'s Wilson 1-A, NWc Lot 4, ATNCL Section 73, ¾-mile west of the Shell-Coleman deep strike in Eastern Archer County, was awaiting acid treatment after filling 2700 feet with oil and drilling fluid from Bend saturation at 5200-15 feet, with 5½-inch pipe at 5161 feet. Bend was topped at 5161 feet, or 128 feet lower than the discovery, which did not show for a commercial well until acidized. Adams Oil & Gas Company's Turbeville 1, NEc Block 49, Jefferson County School Lands and 5 miles southeast of Archer County, tested dry through casing perforations at 4760-95 feet in Bend, topped at 4725 feet, and a later test at 4710-38 feet proved negative. It is slated to be abandoned.

Southwest Texas

Aransas Bay Strike Is Deepest Oil in Lower Coast

Exploration of South Texas Gulf Coast's distillate or condensate structures continues to prove the most important development as new wells are further expanding these producing areas. Several of such areas gained additional oil reserves through flank exploration.

Magnolia Petroleum Company has a flowing oil well with fairly low gas volume in A. A. Seeligson 14, one-mile-north outpost to the East Premont pool of Jim Wells County. This area is primarily a condensate producer, although several oil sands have been established. No gauge was available, but the well was rated as a good producer from perforations at 6625-27 feet. It had flowed clean oil in 12 minutes under 55 pounds pressure after perforation. Bottom is at 6802 feet with casing set 6757 feet.

Gulfboard Oil Corporation's State 1-239, on Mud Island in Aransas Bay, Aransas County, is flowing oil through small choke, not fully cleaned, after perforations were made 9210-16 feet. The test is opening a new submerged field for this trend and is one of the deepest producing areas in South Texas, bottomed at 9257 feet in the Frio. Harry Edwards is the contractor.

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Dabney 1, Section 80, and 2 miles east of production in the Agua Dulce field, Nueces County, gauged approximately 35 barrels of 56-gravity distillate per day through ⅛-inch choke, showing a gas/oil ratio of 28,570 cubic feet to the barrel, after completion was effected through perforations at 7216-21 feet, to open a new field. It is bottomed at 7503 feet and rated up to 100,000,000 cubic feet per day of gas open flow.

Seaboard Oil Corporation recovered a small amount of distillate along with 1,500,000 cubic feet of gas per day from J. O. Chapman Estate 1, SW Section 78, 2½ miles east of the Luby field, in Nueces County. Drilled to 7628 feet, it was plugged back and perforated at 4023-27 feet. Flow was through 3/16-inch choke, showing 1320 pounds tubing and 1370 pounds casing pressure. It was contracted by Allen & Morris.

Humble Oil & Refining Company's A. A. Egg 1, six miles northeast of LaWard and on the Clare & White Leagues prospect in Jackson County, was progressing below 6500 feet, but will be plugged back to test a series of showings. It is reported to have encountered a sand section around 5200 feet in the Frio which showed for a commercial producer. All information concerning results are being withheld.

New Gas Sand in Jim Wells

O. W. Killam was opening a new gas sand in the Sandia field of Jim Wells County with W. P. Wade Estate 12, being completed through perforations at 3904-12 feet.

New perforations were made in sand at 5510-21 feet in Transwestern Oil Company's McFaddin 18-E, in the McFaddin field of Victoria County.

McSpadden Company's Clark 1, nine miles south of Port Lavaca and in the Hennessee Survey, Calhoun County, after finding a gas sand at 5786-98 feet, is drilling below 6200 feet.

Magnolia Petroleum Company's reworking project in the LaGloria area of Jim Wells County was resulting in the opening of more oil sands. The field primarily has been considered a distillate field and a recycling plant is under construction. W. C. Hornsby 1, completed November 29, 1939, by Magnolia Petroleum Company, was reperforated in sand at 7066-80 feet and on a 24-hour gauge flowed 155.27 barrels of 38.5-gravity oil through 3/16-inch choke. It showed 300 pounds working pressure on tubing and 2675 pounds on casing. D. O. Maun 1 is now in the process of being reworked.

Anderson Prichard Oil Corporation completed Augusta Mueller 9, on the extreme west side of the Wade City field of Jim Wells County, as a producer in the Alice sand. The company has drilled several wells to this zone in this field, but this is the first successful completion. It was perforated at 4900-03 feet and flowed 121.77 barrels of 31-gravity oil per day through 9/64-inch choke under 175 pounds working pressure. The well had been drilled under contract by Gorman Yoakum Drilling Company.

Plugs were scheduled to have been drilled early last week in McMurry Refining Company's Allen and Miner 1, Lavaca County, but wet weather, rendering roads impassible, caused a delay in these plans. It is considered, therefore, that the Christmas holiday will be observed before the testing is resumed. This well, located on the Vienna geophysical prospect, is 12 miles east of Hallettsville and 2 miles west of the Colorado County line, on a 628.14-acre tract, M. Muldoon Survey. It was drilled under contract by Wynn Crosby Drilling Company.

Wilcox was topped at 8413 feet and a series of sands was found from 8433 feet to bottom. A good oil sand was found at 8491-8506 feet and the hole was carried to 8524 feet. Salt water sand was logged between 8506-21 feet and shale at 6521-24 feet. Casing was set on bottom.

An outpost, northwest of the oil producer and northeast of the distillate discovery well in the Thomaston field of DeWitt County, has been commenced as the Atlantic Refining Company's third well in that Wilcox area. The test is Herbert Zengerle 1, Lockhart Survey.

Shell Oil Company was drilling below 9250 feet in Plow Realty Company 3, northeast of production in the Sheridan field of Colorado County. It logged two Wilcox sands below the regular field pay, each of which had producing possibilities. In the same county, W. R. Davis, Inc.'s Brownson 1-A, south of the Garwood area, was coring close to 10,000 feet.

Texas Gulf Coast

Chocolate Bayou Extended; Marine Campaign Continues

Phillips Petroleum Company extended the Chocolate Bayou gas and distillate area 1¼ miles west, and may complete Houston Farms Development Company 1, Perry & Austin Survey, Brazoria County, as a gas well. Flow from 9690-93 feet was ungauged, being gas with only a small amount of distillate. Tubing pressure was 400 pounds, casing pressure 2500 pounds. The company's Triangle Development Company 1, mile east outpost, was coring and drilling near 11,200 feet. Between these two tests is Andrau 1, drilled by Glenn McCarthy and purchased by Phillips Petroleum Company, officially the deepest producer in Texas, with flow from 11,430 feet. This record may be succeeded by McCarthy's Munson 1, wildcat on the Bailey's Prairie prospect, S. Carter Survey, Brazoria County, which reported a distillate flow from 11,650 feet two months ago and was taken from the reports pending official gauge. Prospect that completion may be made at some depth in this well was increased as McCarthy was reported adding acreage in the vicinity.

Pan American Production Company acquired 1774 acres in the Gillock, or Kohfeldt area of the Dickinson field, Galveston County, by purchase to mark the second largest cash transaction of 1940 in the upper coastal sector. From The Pure Oil Company and Texas Gulf Producing Company, the purchasers took 1500 acres with four distillate wells for cash, override, and obligation to drill four more wells at 90-day intervals. By outright purchase and override, with no drilling obligation, the company took 274 acres of the Fream tract from Humble Oil & Refining Company. There are four gas-distillate wells on this acreage. Cash consideration for both deals was unofficially reported as totalling $200,000. The purchase, which lies seven miles northwest of the company's refinery at Texas City, was made to insure gas supply for the refinery. The existing line from Gillock to the refinery will be used for transmission. Kohfeldt B-1, one of the wells taken from The Pure-Texas Gulf joint account, was completed last week to score a major extension of 3800 feet southwest. Flow was from perforations at 8695-8705 feet, with pressure 3000 pounds.

Humble Oil & Refining Company off-

set a failure with a new location in the Galveston-Trinity Bay campaign. State 5-C-45, offsetting the discovery at Fishers Reef, Trinity Bay, was abandoned at 9952 feet, while the company staked State 11-A-222, a mile northwest of State 3-A-248, recent oil discovery at Red Fish Reef in Galveston Bay. The company's State 7-A-264 was plugged from 9710 to 9132 feet for perforation, while State 8-A-223 was drilled past 6400 feet. State 9-A-263 was drilled past 8900 feet.

Activity at Dyersdale, Houston area, Harris County, continued active as H. C. Cockburn staked Burkett 1-A, between Burkett 1 and Burkett 7, to be drilled to the 3040-60-foot Miocene gas horizon as a fuel well. Cockburn's Burkett 15 was completed for 500 barrels on a ¼-inch choke through 40 perforations at 4064-74 feet, with tubing pressure 180 pounds, casing pressure 450 pounds. Burkett 7 was waiting on potential for completion at 4058-78 feet.

Stanolind Oil & Gas Company recompleted Burgess 1, 1660 feet south of Hodnett 1 at Rowan, Brazoria County. Completion at 8537-47 feet for 218 barrels daily through ⅛-inch choke, with tubing pressure 1500 pounds, casing pressure 1625 pounds, showed an excessive gas/oil ratio. The well was deepened five feet for reperforation at 8540-54 feet. Humble Oil & Refining Company drilled Hubbard 3 past 8100 feet.

The Texas Company abandoned Wyer 1, Section 10, W. F. Dobbins Survey, 5 miles north of Louise, Wharton County, at 4010 feet. General Well Service was the contractor.

Geophysical activity included a Tide Water Associated Oil Company seismograph crew east of Rosharon in Fort Bend County; a Stanolind Oil & Gas Company crew east of Fresno in the Haywood, Talmadge, and HT&B Surveys; a Gulf Oil Corporation crew south of Stratton Ridge, Brazoria County, in S. F. Austin and Lightfoot surveys; while The Pure Oil Company continued to work around Manor Lake in Brazoria County. Stanolind Oil & Gas Company was also shooting south of Nash Dome, in HT&B Survey No. 3, Fort Bend County; Tide Water Associated Oil Company was shooting southwest of Angleton, Brazoria County, in the J. B. Bailey Survey; Gulf Oil Corporation worked south of Stratton Ridge in the Archer Survey, Brazoria County, and Barnsdall Oil Company surveyed southwest of Danevang, in Wharton County.

Rule Smith's Term Expires January 1

Texas Railroad Commissioner Lon Smith's term of office ends January 1, according to an opinion handed down last week by Texas Attorney General Gerald C. Mann. The commissioner took office on January 15, 1935, and had been elected for a six-year term.

During the interval, the statute was revised to provide that terms expire on January 1.

The ruling may result in qualification on January 1 of Olin Culberson as Smith's successor.

Olin Culberson will take the oath of office as a member of the commission January 2. The ceremony will take place in the Senate chamber of the state capitol.

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Louisiana Gulf Coast

Plaquemines Parish Provides Year's Fifteenth New Field

Gulf Refining Compny found the district's fifteenth field for 1940, completing Timolat 1-B, Section 36-22s-30e, in West Bay, Plaquemines Parish, for 456 barrels of 31.8-gravity oil daily through 3/16-inch choke from sand perforated at 7267-85 feet. Tubing pressure was 1350 pounds, and casing pressure 600 pounds. On preliminary gauge the well flowed at the rate of 730 barrels daily through ¼-inch choke, with tubing pressure 1325 pounds, casing pressure 1350 pounds. The test was regarded as a certain field opener since 8-minute drill-stem test two weeks ago recovered 5300 feet of oil under 170 pounds working pressure, with 3/16-inch top choke and ¼-inch bottom choke. The discovery also revealed possibilities in five sands which were not tested. Electrolog of section at 5045-65 feet showed 50 mv and 5 ohms, while second log showed strong kicks at 6392, 6616, 6730 and 7010 feet. The test, third for the prospect, ran high compared with the company's Buras Levee District 1-D, Section 6-23s-31e, a 10,100-foot failure earlier in the year. The prospect was found by the company in 1938 with reflection seismograph.

The boom in drilling at Iowa, Jefferson Davis and Calcasieu Parishes, touched off by Magnolia Petroleum Company's discovery of an 8200-foot pay, will probably be prolonged as Shell Oil Company opened another new sand, this one at 7570-73 feet. Flow was 350 barrels of 47.1-gravity gas-distillate daily through ¼-inch choke, with tubing pressure 2700 pounds, casing pressure 2550 pounds, gas/oil ratio 6000/1. This well, in Section 13-9s-7w, near the center of the field, was heralded as a deeper sand discovery, but flowed only 1,300,000 feet of gas daily, under 2200 pounds pressure, from a sand at 8750-8763 feet. Drill-stem test of the original objective, the 8200-foot horizon, recovered salt water, while drill-stem tests in the discovery zone at 7580 feet recovered distillate, sand and salt water.

Shell Oil Company also opened a new sand at Happytown, St. Martin Parish, when Iberville Land Company 2, Section 87-7s-8e, 200 feet southwest of the discovery, flowed 325 barrels of 38.7-gravity oil daily through 10/64-inch choke from 10 perforations at 9948-55 feet, flowing also 2,350,000 feet of gas, with tubing pressure 1600 pounds, casing pressure 2025 pounds. The new productive level is the second for the field, as the discovery was completed in November, 1939, for 374 barrels of 39-gravity oil daily from 9745-58 feet. The test is the second since discovery, the first, Schwing Lumber Company 1, being abandoned at 10,946 feet in June.

The Texas Company found the fourth, and shallowest, sand at Jefferson Island field, Iberia Parish. State-Lake Peigneur 4, in the lake, flowed 66 barrels of 29-gravity oil daily through ¼-inch choke, with tubing set on seal at 300 feet. Pressure was 45 pounds. The company is not expected to complete in this sand, but drill to completion in the 7700-8200 foot levels.

Potential for Freeland 1, Humble Oil & Refining Company's recent new sand discovery at South Crowley, Acadia Parish, was 76 barrels of 34.1-gravity oil daily via ⅛-inch choke from perforations at 7093-97 feet. Tubing pressure was 575 pounds, casing pressure 1525 pounds, with a gas/oil ratio of 460/1. The test, in Section 27-10s-1e, is ½-mile east of the company's two Leger producers, which are flowing from 7602-7612 and 8917-8922 feet.

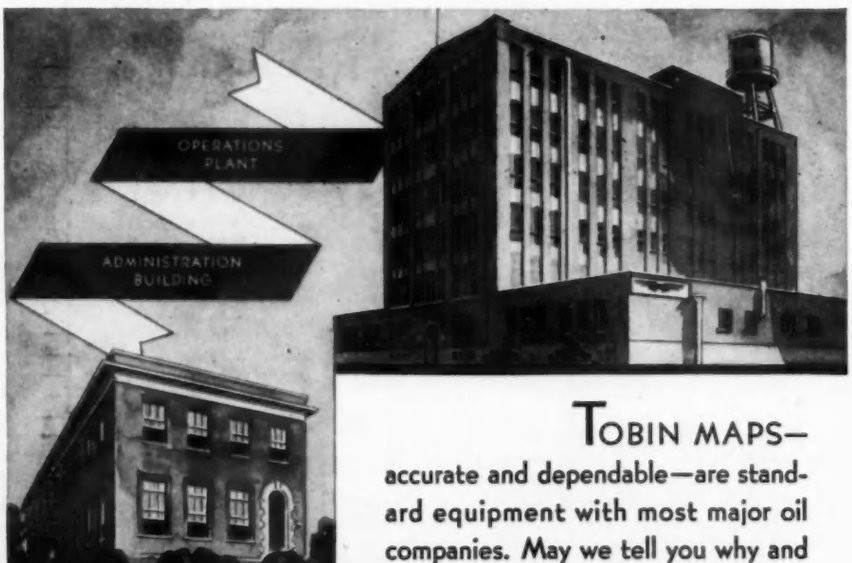
A 3000-foot southwest extension loomed at Villa Platte, Evangeline Parish, where Continental Oil Company's Evangeline Securities Company 1 cored 60 feet of distillate sand at about 10,100 feet. The test was plugged from 10,127 to 10,080 feet, where operations were suspended, reportedly for lease and royalty taking. Gulf Oil Corporation's Vidrine 1, southeast flank outpost, and the company's first well in the field, was completed for 528 barrels daily through ¼-inch choke from 116 perforations at 10,078-108 feet, with tubing pressure 1300 pounds, casing sealed.

Union Sulphur Company's 1600-foot northwest extension to the Sulphur Mines field, Calcasieu Parish, did not materialize as company pulled screen and liner from Ulrich 4, Section 19-9s-10w, after the test made seven barrels of fluid daily via ⅛-inch choke from 36 perforations at 6640-50 feet, with tubing pressure 935 pounds, casing pressure 1200 pounds, 1,200,000 feet of gas accompanying the oil flow. The company staked Ulrich 5 in the same section as a west outpost.

The Neale field, most rapidly developed of the 1940 South Louisiana discoveries, is now loosely defined on three sides as Atlantic Refining Company quit Rice Land & Lumber Company 1-C, 1½-mile west outpost, at 8420 feet. The regular Wilcox section was found only slightly low structurally, but carried salt water, with pressures low. The company also abandoned Musser-Davis Lumber Company 4, north edge test which found the Wilcox tight. The east side has been pegged a mile from the field by Bayport Oil Company's Rice Land Company 1, which logged the Wilcox 120 feet low.

Titanic Oil Company's Natalbany Lumber Company 1, a farmout from Shell Oil Company in Section 7-9s-12e, St. Gabriel prospect, Iberville Parish, spudded and shut down because of high water. This wildcat will be closely watched as the prospect is regarded as one of the most promising in South Louisiana since Shell Oil Company's Natalbany 1, Section 9-9s-2e, swabbed oil and water from 9050-53 feet, and the company's Natalbany 2, Section 19, attempted blowout at 9267-70 feet. A rigid drilling program insisted upon the feeholders is said to have retarded exploration.

Frank Campbell abandoned Darby 1, wildcat in Section 56-11s-6e, Spanish Lake prospect, St. Martin Parish, at 8011 feet. Campbell took the well at 5000 feet upon receivership of the Frank Bennett interests. Stiochiometrical Minerals Company's St. Paul-Bourgeouis 1-F, Linden prospect, Section 49-13s-8e, St. Mary Parish, wildcat said to have been staked upon results of a new system of soil analysis, was left at 5000 feet. Henry J. DeArman drilled the well.



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North Louisiana

Athens in Claiborne Parish Assured Gas-Distillate Field

Although testing of the discovery well continued, the Athens area of Claiborne Parish, appeared to have been assuredly added to the list of gas-distillate fields of North Louisiana last week. The well, producing from the Travis Peak, is Skelly Oil Company and Sun Ray Oil Company's Volentine 1, NW NW 31-20n-6w, which produced 60 barrels of 61.4-gravity distillate with 1½ million cubic feet of gas daily on various-sized chokes after reperforating at 6317-32 feet. Total depth is 6507 feet.

With elevation of 404 feet, the Volentine 1 showed porous sand at 6157-70 feet; asphaltic sand at 6213-21 feet and porous sand from 6317-32 feet.

Considerable leasing developed in the area. Ohio Oil Company secured 60 acres in Section 32-20n-6w, and Olin J. Baird of Shreveport secured 100 acres in the vicinity.

Union Producing Company staked two new locations on the northwest side of the Sugar Creek field, Claiborne Parish, only five miles from the Athens wildcat, both to seek oil production from the Travis Peak. One is in Section 36-20n-6w, and the other in Section 32-20n-5w.

J. D. Carruthers and associates plan to drill three immediate tests in the Lisbon field, Claiborne Parish, where they apparently have a second Lower Marine gas-distillate well at 9008 feet in Burgess-Simmons 1, C W½ SW 2-20n-5w. One of the new tests will be to the Lower Marine and the other two will go to the Travis Peak. Regular producing level at Lisbon is basal Glen Rose lime.

Two and a half miles north of Lisbon production, Union Producing Company's Meadows A-1, C NE 18-21n-4w, drilled at 10,420 feet. In Township 22 north, Range 5 west, Claiborne Parish, for the account of E. J. Bousella, A. M. Neelley of Shreveport has taken a 4000-acre block.

The exploration campaign across the state just south of Angelina-Caldwell Flexure continues unabated. Last week Louark Producing Company secured geophysical option on 60,275 acres of Urania Lumber Company acreage, located in parts of Caldwell, LaSalle and Winn Parish.

T. L. James & Company of Ruston, Louisiana, secured leases on 4000 acres of river beds in LaSalle Parish, and Shell Oil Company secured a similar amount of state land in the same parish. Sinclair Prairie Oil Company leased 3000 acres in Township 9 north, Range 7 east, Catahoula Parish. In the same parish, Smith Brothers of Houston made location for a wildcat, McCormick 1, C NW SW 29-11n-8e. Continental Oil Company and The California Company plan another wildcat test two miles northeast of the former's recently abandoned 9200-foot hole, tentative location for the new test being in Section 6-9n-8e. Kernel Hughes of Tyler, Texas, plans a 3500-foot wildcat in Section 36-9n-9e, Concordia Parish. V. V. Ryan and associates secured 3000 acres in Township 13 north, Ranges 3 and 4 east, Caldwell Parish, and Tom B. Slick, Jr., leased a similar amount in the same township and ranges.

Gulf Refining Company secured geophysical option on 30,000 acres in Townships 6 and 7 north, Ranges 4, 5 and 6 west, Natchitoches Parish, near Cloutierville. In the same parish, J. B. Parker of Dallas, Texas, leased 7000 acres in Townships 11 and 12 north, Range 6 west for a proposed 6500-foot test to start by next February 1. This acreage was recently shot.

Fourteen geophysical units were working in the Angelina-Caldwell Flexure trend last week.

Southern Production Company, subsidiary of Southern Natural Gas Company (Birmingham, Alabama), which recently secured large tracts of acreage around the Joaquin, Texas, gas-distillate field, Shelby County, Texas, and extending across the line into DeSoto Parish, Louisiana, made its first location on the Texas side. The new test is J. F. Price 1, J. M. Smith Survey. This company is already drilling two east outpost tests on the Louisiana side of the field.

Arkansas

Buckner Townsite Well On 40-Acre Unit Block

The Buckner field, located in parts of Columbia and LaFayette counties, was extended a quarter mile west last week to give Buckner its first townsite producer when J. W. Love's Eddy Unit 1, Section 12-16-23, was completed, after acidization, at 7305 feet, flowing 413 barrels in 24 hours through ¼-inch tubing choke, with casing pressure 200 pounds, and tubing 375 pounds. Location is on a 15-acre plot in a unitized 40 acres. The Buckner series was topped at 7050 feet, 11 feet higher than other wells on the west side of the field.

A half-mile east extension of the deep McKamie gas-distillate field, LaFayette County, appeared assured last week when Normandie Oil Company's Cornelius 1, NW SW 28-17-23, cored in the Smackover lime with distillate odor pronounced. In a core from 9258-85 feet, oolitic lime ranging from good to fairly tight, with distillate odor throughout, was recovered and operators reamed down to continue coring. Elevation is 271 feet. The other two 9200-foot gas-distillate wells, both in Section 29-17-23, are owned by Atlantic Refining Company, discoverer of the field. In this area, Sinclair Prairie Oil Company received by assignment from Edson Petroleum Company W½ SW SW 26-17-23, also SE SE 27-17-23, and NW NW 35-17-23.

Williams & Jenkins have taken a 4000-acre wildcat block around Section

Same Problem Every Year!

There is nothing we can say in this Christmas issue likely to influence sales next year. It doesn't seem important. This is PELCO's thirty-third Christmas. We are inarticulate with thoughts of business already enjoyed and friendships that are old. You can't thank customers for thirty-odd years of loyalty. So the problem remains unsolved but acutely present in our minds. And that, we hope, is what matters. Merry Christmas. Happy New Year.

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SHREVEPORT LOUISIANA

PELCO

Houston
Berwick
Houma
New Iberia
Magnolia

23-16s-8w, Ashley County, for a 5000-foot test to spud by March 1.

Three drilling permits were issued last week by the Arkansas Oil and Gas Commission, as follows: Columbia County—McAlester Fuel Company, K. J. Sayers 2, C SW SE 10-18-22; Union County—Marine Oil Company, Thompson Estate A-3, 250 feet west and 305 south NEc SW SE 3-18-13; and E. G. Bradham, A. E. Slaughter 1, 430 feet north and west SEc SE SE 9-17-16.

Southeastern States

Leasing Activity Continues Along Gulf Coast

Mississippi and Alabama saw only routine activity last week. As for several weeks past, there continued to be some concentration of leasing activity in the Gulf Coast area of the two states, but wildcatting continued at a low ebb, with little indication of a spurt in drilling before spring.

Thirty-two geophysical units worked in the two states, of which eight were in Alabama. One unit working for Exchange Oil Company, moved from Mississippi to Lake County, Florida. In the latter state, work for Humble Oil & Refining Company was being done in Santa Rose and adjoining counties.

Barnsdall Oil Company's T. R. Woodruff 1, C NW 6-10n-2w, north edge test at Tinsley Dome, Yazoo County, may be abandoned. It showed salt water in the Perry sand and later swabbed dry. Casing was perforated in this formation at 5371-73 and 5371-75 feet. With elevation of 2344 feet, it logged chalk at 4750 feet, topped Woodruff sand at 4936-58 feet, and topped Perry sand at 5371-76 feet.

Waggoner Brothers Oil Company has taken over Brander and Barker's Parker 1, NW NW 17-14n-1e, Warren County wildcat on Davis Island, and was preparing to spud.

Champlin Producing Company's Galloway Coal Company 1, C SW 12-13s-10w, Walker County, Alabama, which drilled to 4183 feet in Ordovician, plugged back to 2215 feet and was arranging to acidize at 2193 feet where a showing of gas was reported. Elevation is 600 feet.

Tatum Lumber Company (W. S. F. Tatum), Hattiesburg, which drilled into a salt dome above 2000 feet in a recent test on its fee land in Section 14-2n-16w, Lamar County, was reported negotiating with Freeport Sulphur Company to farm out acreage around this location for test to be drilled by the latter company. Exchange Oil Company is reported asking for bids for a deep test on its block in Township 9 north, Range 6 east, Leake County.

Notwithstanding that neither test reached either anhydrite or salt, a theory has been advanced that Sun Oil Company's two core holes in NW SE NW 7-8n-14w, Covington County, have indicated presence of a salt dome. One test went to 2093 feet, and the other, in SE SW NE 32-6n-19w, Jeff Davis County, went to 1915 feet.

Amerada Petroleum Corporation was taking leases in Townships 14, 15 and 16 south, Ranges 9, 10 and 11 west, Fayette County, Alabama.

Michigan

McKenna 1, Touted as Basin Discovery, To Be Plugged

Sun Oil Company was preparing to abandon McKenna 1, SE SW SE 15-19n-3w, Clare County, completed last August 16 for a promising pool opener. Test flowed 1290 barrels oil first 21 hours natural from Dundee dolomite at 3753½ feet, and 1503 barrels next 24 hours. However, in six days production dropped rapidly and the well started to cut water. Attempts to plug back were unsuccessful, and plugging orders were issued last week. Well produced around 9000 barrels in all.

Six other Dundee tests were drilled, including east and west offsets, without logging production in the wake of McKenna 1, which initially carried hopes of a much needed basin field. Sun Oil Company is now drilling McIntyre 1, 1½ miles northwest of McKenna 1, which has been dubbed as the "last chance" for a field in the district.

Acidized with 500 gallons, Walter L. McClanahan's Campaigner 1, SW SE SE 11-14n-4w, Overisel Township, Allegan County, pumped and flowed 10 barrels an hour and rated for a 150-barrel completion as a semi-wildcat two miles northeast of older Traverse lime production in the same township. McClanahan has about 800 acres, about 50 percent of which was farmed out by Gulf Refining Company under lease. Well is producing from Traverse lime, topped at 1552 feet and bottomed at 1553 feet. Natural, it carried 400 feet of oil in 10 hours.

Gulf Refining Company started preliminary work for rebuilding derrick and setting a new rotary rig on Bateson 1, Section 2-14n-4e, Bay County, wrecked by fire on December 5 following a gas blowout at 7776 feet. A gauge for gas made on the vent pipe, through which gas is being burned, showed 4,580,000 feet, with 1000 pounds pressure at the mastergate and 800 pounds against the choke. Gas is from the Salina.

Weber Oil Company logged Dundee objective at 2600 feet on Krug 1, Section 11-23n-2e, Ogemaw County wildcat, but had not reported either oil or gas saturation at 2650 feet.

Lenoran Petroleum Company made a last-minute switch and moved into Cheboygan County for Commeau 1, SE SE 23-35n-1e, after earlier announcing a test in Presque Isle County, which borders Cheboygan. The shift in locations ended temporarily any bid for Presque Isle's long standing bonus offer of $25,000 to the company that drills the first well to produce 200 barrels a day for 10 consecutive days.

Freeman Oil Company was clearing location for Woods 1, wildcat in NE NE 34-20n-4w, Clare County.

California

Second Deep Test for Wheeler Ridge Has Salt in Eocene

In the Wheeler Ridge area of Kern County, Richfield Oil Corporation's KCL 2, deep test at the southeastern end of the field, failed to make a commercial producer from the Eocene. Formation test run on interval 10,862 feet to bottom at 10,934 feet resulted in an estimated flow of 300 barrels daily rate of salt water along with a trace of 38-gravity oil, accompanied with a small gas blow. The company has resumed drilling in an effort to find a deeper producing sand. This is the second deep test the company has drilled at Wheeler Ridge, and is part of a 10-well prospecting program for examination of some 40,000 acres of prospective oil land at the southern end of the San Joaquin Valley. Failure of this well to develop production may result in postponement of further drilling in the territory for the present.

Considerable interest attaches to a prospect being drilled by Tex Harvey Oil Corporation in the Huasna district of San Luis Obispo County, Section 11-32-14. Bottomed at 4518 feet with water string set at 3520 feet, the test has been swabbed but so far has failed to flow. Fluid level has risen to about 800 feet, consisting of mud and 27-gravity oil. Formation is believed to be the lower Santa Margarita, and it is said to be the best deep-sand showing yet encountered in the Huasna area. Test was first undertaken by Gilmore Oil Company.

Hancock Oil Company of California is believed to have cored sufficient oil sand in the Chanac zone in Roberts 1, wildcat in Section 6-30-28, Union Avenue district of Kern County, to make a small well. Coring has revealed streaks of oil sand from 4028 to 4275 feet. Since going out of oil sand, the test has been cored and drilled to 4812 feet in hard shale with occasional sand streaks. At present it is drilling the Santa Margarita formation, and if showings are unimportant, a test will be run on the Chanac interval. The company has 400 acres, made up of small parcels.

Standard Oil Company of California's deep test, Los Angeles Investment 3-1, Section 17-2-14, Inglewood-Baldwin Hills district, Los Angeles County, cored oil sand and shale at 8525-70 feet. Formation test resulted in estimated 5,000,000 feet of gas and 100 feet of mud and condensate. It was being cored below 8600 feet.

Formation test on Turf Oil Company's Turf Club 2, wildcat in the Inglewood-Potrero area, at 5510-70 feet, showed fair blow of gas and recovery of water and small amount of oily mud.

Cal-Pico Oil Company's Beach 1, wildcat in Section 7-2-11, West Whittier area, Orange County, has been indefinitely suspended after failing to get formation tester down in attempted test of gray sand interval at 6000 feet. Water and mud were recovered on previous tests at 6500 and 6200 feet.

UNITED STATES WELL COMPLETIONS

Company, Well and Location	Init. Prod. Bbls.	Depth
Arkansas		
Columbia County (Buckner)—		
J. W. Love, Eddy Unit 1, 12-16-23	413	7305
California		
Fresno County (Coalinga Northeast)—		
Bandini Pet. Co., No. 61-30B	No est	8225
Standard, No. 58-19B	711	8267
Union, Cook 77-18B	982	8220
Fresno County (East Coalinga Eocene)—		
Robert S. Lytle, No. 86-18F	2171	8015
Kern County (Belridge)—		
Belridge Oil Co., No. 1-2	No Est	8262
Kern County (Coles Levee)—		
Richfield, KCL-B 72-4	775	9750
Kern County (Rio Bravo)—		
Superior, Fink 4	1575	11,460
Kern County (Ten Sections)—		
Shell, KCL A-85-30	192	8244
Kern County (Wasco Area)—		
Pacific Western, Meyer 1	*	13,150
Kings County (Kettleman Hills)—		
KNDA, No. 26-18Q	1058	7560
Los Angeles County (Aliso Canyon)—		
Tide Water, Porter 24	1182	5365
Los Angeles County (Inglewood)—		
Kettleman & Inglewood Corp., Rubel 26	470	3855
Los Angeles County (Wilmington)—		
C. M. Morse, Avalon 1	115	3730
Sonwell Oil Co., No. 1	260	3625
Union Pacific, UP 44	105	3348
Santa Barbara County (Santa Maria Valley)—		
Union, McCoy-Cooney 2	126	5440
Ventura County (San Miguelito)—		
Continental, Grubb 4	170	7314
Ventura County (Ventura Avenue)—		
Tide Water, Lloyd 115	300	9930
Illinois		
Bond County—		
Paul Holleman, Basler 1, ne nw se 25-4n-3w	*	1155
Clay County—		
Pure, Pierce 2, e½ nw sw 15-2n-8e	280	3083
Clinton County—		
Nat'l. Consumers Oil, Fricks 1, nw se sw 14-1n-2w	*	1372
Adams O. & G., Copple 27, nw sw se 35-2n-1w	gas inp	1229
Coles County—		
W. R. Miller, Taylor 1, sw sw ne 33-14n-10e	*	900
Edwards County—		
Ralph Neely, Michael 1, nw se nw 8-1s-10e	*	3367
Arrow Dr. Co., Stafford 1, se ne ne 13-2s-10e	51	3250
Stafford 2, sw ne ne 13-2s-10e	*	3262
Tuesday Oil, Horton 2, sw nw se 13-2s-10e	22	3341
Works 4, nw ne se 13-2s-10e	250	3212
Effingham County—		
Jarvis Bros., Reitz 1, sw sw se 13-7n-5e	*	2704
Cherry & Kidd, Faber 1, ne se sw 5-8n-1w	*	1616
Carter, Lamina Dial 1, sw se ne 12-8n-3e	48	1544
Lilly 1, se se se 17-8n-3e	42	1594
Stewart Oil, Rhodes 3, sw nw sw 26-8n-3e	12	1592
Fayette County—		
Luttrell, Tucker 4, se nw ne 21-7n-3e	*	1587
Minerva, Richardson 7, nw ne nw 21-7n-3e	62	1542
Franklin County—		
Helmerich & Payne, Sanders-Kimmel 1, sw nw nw 35-7s-4e	5	3114
Gallatin County—		
Carter, York 1, se se sw 33-7s-8e	275	1722
Green County—		
Geo. Brainerd, Bowman 1, s½ 2-12n-13w	*	750
Hamilton County—		
Exchange, Stelle 3, nw nw se 27-5s-6e	160	2968
Friel 11, se ne se 34-5s-6e	85	2963
Gulf, Austin 1, sw ne nw ne 34-5s-6e	105	2983
Kingwood, McGuire 1, w½ sw nw 11-5s-7e	*	3583
Cameron, Griffin 1, sw sw se 31-5s-7e	780	3165
Jasper County—		
Pure, Rohr 1, w½ nw nw 4-5n-10e	1306	2797
Fehrenbacher 1, c e½ sw sw 8-5n-10e	688	2835
Eckel 1, ne se sw nw 16-6n-10e	*	2800
Eckel 2, nec sw nw 16-6n-10e	*	2840
Schulman Bros., Biel 1, ne ne se 18-6n-10e	*	2950
Forrest Oil Co., Swick 1, ne ne nw 20-8n-10e	*	2599
Jefferson County—		
Obering & Phillips, Howe 1, sw nw se sw 25-2s-1e	60	1990
Lawrence County—		
Robinson et al, Warren 2, sw nw ne 29-3n-12w	5	1936
Marion County—		
Texas, Centralia 66, nw sw se sw 4-1n-2e	196	1864
Montgomery County—		
W. L. Topf, Fisher 1, nec sw 19-9n-3w	*	1021
Scherrer et al, Lyon 1, se ne ne 28-10n-5w	*	664
Perry County—		
Blankenship, Bedmarkwicz 1, sw sw nw 24-4s-2w	*	1381
Richland County—		
Pure, Rohr 1, w½ nw nw 23-4n-9e	54	2616
Tippit 1, c e½ ne ne 31-5n-10e	*	2795
Zerkel 1, c w½ sw sw 32-5n-10e	*	2740
Shelby County—		
Rose & Durbin, Fleener 1, c sw sw se 9-10n-4e	*	1702
St. Clair County—		
Dr. Rose, Otten 1, nw se se nw 28-1n-10w	*	727
R. A. Roth, Mensey 1, ne se sw ne 33-1n-10w	*	815
Wabash County—		
C. A. Evarts, Hahn 1, sw nw se nw 8-1n-12w	*	1545
Wabash Co., Litherland 5, sec ne sw 8-1n-12w	30	1536
Big Chief Dr., Seibert 1, se sw nw 34-2n-13w	*	2688
Smokey Oil, Kennard 2, ne nw se 9-2s-13w	110	2472
W. W. Gray, Fee 11, sw nw se 14-3s-14w	600	2526
Longhorn, Helm 5, nw se ne 27-3s-14w	125	2590
Washington County—		
Mudge Oil, Langel 1, se ne se 22-1s-1w	40	1549
Pugh, Wynn 1, c nw sw sw 33-3s-1w	*	1671
Wayne County—		
Pure, McCracken 3, nw nw sw 3-1n-8e	*	3105
Miller 4, w½ se nw 4-1n-8e	65	3130
Hubbell 1, nw se se sw 29-2n-8e	500	3080
Duncan, Skelton 4, w½ nw ne 32-2n-8e	312	3086
O'Meara, McLinn 2, ne sw ne 9-2s-7e	250	3282
Robinson et al, Felix 6, ne nw nw 35-2s-8e	58	3855
White County—		
Patton & Carey, Reeves 1, nw nw se 28-3s-14w	200	2617

[*Continued on next page*]

*Failures; †Junked; ¶Million cu. ft. gas.

Summary of Drilling Operations in the United States, Week Ended December 21, 1940

	WELLS COMPLETED							*PERMITS FOR NEW WELLS				
	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1940	Total this Date 1939	This Week	Total this Month	Total 1940	Total this Date 1939	Year Total 1939
Alabama	.....	.....	.....	.....	.....	9	2	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Arkansas	1	1	.....	.....	413	179	225	3	10	150	223	223
California	18	17	.....	1	10,192	1,077	1,088	11	51	1,080	1,174	1,174
Colorado	.....	.....	.....	.....	.....	10	19	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Illinois*	76	49	.....	27	9,341	3,912	3,894	65	226	4,454	893	893
Indiana	10	2	.....	8	525	517	295	.....	.....	.....	.....	.....
Iowa	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Kansas	47	34	3	10	55,516	1,961	1,450	40	117	2,021	1,583	1,583
Kentucky	8	4	.....	4	56	365	659	.....	.....	.....	.....	.....
Louisiana	37	24	2	11	3,820	1,685	1,181	.....	91	1,635	1,449	1,449
Michigan	15	10	.....	5	851	1,180	1,482	.....	38	1,077	1,419	1,419
Mississippi	1	1	.....	.....	650	184	22	.....	.....	.....	.....	.....
Missouri	.....	.....	.....	.....	.....	31	.....	.....	1	26	.....	.....
Montana	3	3	.....	.....	220	191	152	.....	.....	.....	.....	.....
Nebraska	3	1	.....	2	600	47	1	2	7	68	.....	.....
New Mexico*	9	7	1	1	1,625	614	661	10	22	555	293	293
New York†	10	10	.....	.....	20	948	669	.....	.....	.....	.....	.....
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio†	34	5	13	16	24	1,103	1,005	.....	.....	.....	.....	.....
Oklahoma	52	32	6	14	6,657	2,113	2,071	57	122	1,867	2,059	2,059
Pennsylvania†	26	17	7	2	44	3,236	1,555	.....	.....	.....	.....	.....
South Dakota	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Tennessee	.....	.....	.....	.....	.....	12	4	.....	.....	.....	.....	.....
Texas	175	121	6	48	84,258	9,657	9,518	234	599	10,947	10,269	10,269
Utah	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....
West Virginia	19	4	11	4	24	635	591	.....	.....	603‡	718	718
Wyoming	3	.....	1	2	.....	153	156	.....	.....	1	.....	.....
Total this week	547	342	50	155	174,836	29,826	26,700	422	1,284	24,484‡	20,080	20,080
Total last week	483	319	51	113	115,855	29,279	26,003	457	862	24,062‡	19,542	20,080
Total this year	29,826	21,260	1,971	6,595	10,140,975	.....	.....	.....	.....	.....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Illinois date from October 15, 1939; New Mexico from August 1, 1939.
† Includes water-input wells.
‡ Total for West Virginia covers only first 9 months.

United States Well Completions—*Continued*

ILLINOIS—Continued

Company, Well and Location	Init. Prod. Bbls.	Depth
J. H. Liggett et al, Hon 2, se nw se 32-3s-14w	265	2779
Herndon Dr. Co., Bond 6, se se nw 8-4s-14w	65	2639
Garrison 1, nw c sw ne 8-4s-14w	15	2633
D & H Dr. Co., Hon 1, nw se sw 9-4s-14w	250	2844
Burr Lambert et al, Calvin 6, nw ne sw 9-4s-14w	35	2841
Cherry & Kidd, Gray 3, nw ne nw 17-4s-14w	90	2739
Ryan Oil Co., Bramlett 1, ne sw se 17-4s-14w	274	2593
Bramlett 3, sw sw se 17-4s-14w	275	2598
Bramlett 4, nw sw se 17-4s-14w	270	2595
P. E. Tipton, Boultinghouse 2, sw se ne 17-4s-14w	244	2708
Yost et al, Bramlett 2, sw nw se 17-4s-14w	120	2730
Superior, Ford 9, sw se sw 27-4s-14w	125	2960
Ford 2, sw nw nw 24-4s-14w	210	2915
Greathouse 3, sw nw ne 4-5s-14w	75	2899
Mazda Oil & Palmer, Storms 1, c n½ sw se 26-5s-9e	65	3160
Smokey Oil, Wilson 2, nw nw se 11-6s-9e	85	2283
Exchange & Ohio, Pearce 12, nw sw nw 12-6s-9e	100	2279
J. T. Bradley et al, Randolph 1, ne ne se 32-6s-9e	*	3049

Indiana

Benton County—

A. C. Thomas, Fowler 1, nw nw nw 27 25n-9w	*	1750

Knox County—

W. C. McBride, Brevoort 1, sw ne nw 1-2n-11w	*	1838
Midwest Dev. Co., et al, Montgomery 1, sw nw sw 12-2n-11w	*	1936

Gibson County—

Hall Edwards, Rec., Maier 14, ne nw se 14-3s-14w	300	2516
Continental Oil, Bozeman Land 18, nw se ne 23-3s-14w	225	2533

Martin County—

Newton P. L., Ash 1, nw nw sw 31-4n-4w	*	343

Spencer County—

H. M. Hunt, Seay 1, w½ nw sw 32-7s-6w	*	640
O. F. Kelly, Miller & Dome 2, sw ne ne 2-8s-7w	*	1415
Miller & Dome 1, se se nw 2-8s-7w	*	1440
Niles 3, sw ne sw ne 2-8s-7w	*	1400

Kansas

Barber County—

Barbara O. & G., Angell "A" 1, c ne se 10-33-14w	*	5291

Barton County—

Barnsdall, Rous 5, sec sw 28-16-11w	3000	3362
Cities Service, Bitter "A" 8, c n½ se nw 5-16-13w	2054	3359
Stoskopf 4, c s½ sw nw 17-16-13w	410	3410
Transwestern, Fee 2, sec 12-17-11w (otd 3231)	3000	3314
Hollow et al, Kowalsky 5, ne nw ne 18-20-11w	3000	3310
Texas, Burmeister "A," c w½ nw sw 2-17-11w	2210	3296

Butler County—

Boline, Parsley 1, nwc ne 23-25-4e	*	1444
Adair-Morton, Dunne Ranch 1, c e½ se nw 23-26-7e	*	2796
Cromwell-Lewis et al, Schriver 1, nec se 33-27-6e	35	3095

Douglas County—

Forrester, Altenbernd 1, c s½ s½ nw 35-12-20e	*	1605
Ice 1, swc se 9-14-19e	*	940
Douglas County O&G Co., Gage 2, nec se 11-13-20e	*	1130

Ellis County—

Champlin, Hadley "D" 4, c n½ se sw 17-11-17w	3000	3435
Cities Service, McCord 6, nwc se 26-11-17w	2538	3564
Lario, Marshall Ranch 9, c ne se 36-11-18w	3000	3641

Ellsworth County—

Jayhawk, Talsky 2, c w½ sw se 5-16-10w	536	3329
Atlantic, Stoltenberg "A" 4, c n½ se se 27-16-10w	2020	3301
Aylward, Ehler 2, nw ne se sw 35-16-10w	3000	3293

Greenwood County—

Bay, Adams 3, nw se sw ne 17-28-11e	224	1226
Reed et al, Blevins 3, c s½ se ne 17-28-11e	25	1231

Marion County—

Larieux et al, Fosberg 5, swc 21-17-4e	169	2459
McGinnis, Neuwirth 2, sw nw nw 29-17-4e	*	2620

McPherson County—

Westgate-Greenland, Reese 2, c s½ nw nw 19-17-1w	2098	2711
Morine et al, Henne 1, swc ne 21-17-1w	495	2661
Tulsa, Nelson 4, c n½ nw ne 19-20-5w	1313	3335

Osage County—

Edwards, Detrich 1, c nw se 21-14-15e	*	2200

Pawnee County—

Stanolind, Belt 2, csl nw ne sw 13-20-16w	1402	3864

Pratt County—

Skelly, East Maxedon 6, c e½ ne se 25-27-11w	464	3462
Annetta 1, se nw se 1-28-11w	¶42.0	4229
Armistead "B" 1, nw sw nw 2-28-11w	¶14.0	4183

Rice County—

Barnsdall, Wernet 1, c s½ se ne 12-20-6w	*	3408
Colorado Pet., Keesling "B" 1, c e½ se nw 10-20-9w	413	3237
Ingling, Small 1, c sw nw 22-21-9w	¶12.0	3540

Russell County—

Jones Bros., Mahoney 3, c s½ nw sw 8-14-12w	*	3017
Central Pet., Boxberger 5, c s½ ne se 26-14-14w	3000	3001
Landon et al, Boxberger 4, ne nw se 26-14-14w	3134	3023
Gore et al, Michel 2, c e½ se nw 36-14-14w	2104	3163
Stanolind, Mermis "B" 18, sw nw ne 5-14-15w (otd 3084)	18	3115
Cities Service, Millberger 1, c w½ nw ne 13-14-15w	375	3265
Shelburne et al, Neidenthal 1, c e½ nw nw 13-14-15w (otd 3052)	50	3071

Stafford County—

Shell, Bean 2, nw se sw 21-23-12w	261	3856
Magnolia, Tretbar 2, ne se se 12-24-11w	2259	3776
Stanolind, McComb 5, c s½ sw nw 12-24-11w (otd 3744)	897	3783
Charles 2, c e½ nw se 15-24-12w	3000	3835
Phillips, Tretbar 1, c s½ se nw 12-24-11w (otd 3738)	3000	3791
Winkler-Koch, Equitable Life 2, c w½ se ne 15-24-11w	3000	3822

Kentucky

Daviess County—

Sargent et al, Burns 1	*	1887
Ohio, Coombs 7	6	1250
Coombs 8	*	1304
Creek Dr., O'Flynn 3	5	1378
A. D. Shaffer et al, Johnson 4	35	1475
Rickenbraed & Raydure, Salmon 1	10	914

Hancock County—

Hart & Hart, Haywood 2	*	906

Ohio County—

H. M. Hunt, Rusher 3	*	365

South Louisiana

Anse La Butte—

Stanolind, Martin 1-B	65	4850

Bay St. Elaine—

Jeff. Lk. Sulp., S. D. Roy. 6	*	1275

Chalkley—

Humble, Hanszen 12	*	8473

Eola—

Richardson, Haas 1-D	324	8580

Fausse Point—

Sun, Planters 4	*	1764

Golden Meadows—

Frankhos et al, Collins 1	118	5502
Texas, La Terre 8	650	7940
C. R. Schuster, Broussard 1	*	2698

Happytown—

Shell, Iberville Ld. 2	324	10,650

Iowa—

Shell, Heyd 32	355	9000

Jefferson Island—

Texas, State 4	66	3075

Jennings—

Gulf, Arnaudet 44	392	7585

Neale—

Atlantic, Rice 1-C	*	8420
Musser-Davis 4	*	8420

Sorrento—

F. O. Roshko, United Lds. 1	10	4448

South Crowley—

Humble, Freeland 1	76	9020

Starks—

W. T. Burton, Lutcher-Moore 3	*	6060

Sulphur—

Union Sulphur, Ulrich 4	*	6685

University—

Helis, Nelson 11	243	6794

West Hackberry—

Stanolind, State 57	*	9755

West Lake Verrett—

Shell, Jeanerette Lbr. 6	¶1.37 & 25	8985

Plaquemines Parish—

Gulf, Timolat 1-B, West Bay	456	7290

St. Martin Parish—

Frank Campbell, Darby 1, Spanish Lake	*	8011

St. Mary Parish—

Stoichiometrical Minerals, Bourgeouis 1-F	*	5000

North Louisiana

Caddo Parish (Pine Island-Vivian)—

Butler Pro. Co., Williams 1, 24-22n-16w	sw dis	2648

Caddo Parish (Pine Island)—

A. R. Hancock, Helpman 7, 16-21n-16w	10	1003
Juan & McFatrick, Hobbs 5, 28-21n-15w	sw dis	1700
Texas Co., Cullinan Fee 2, 32-21n-15w	20	1512
Four Star Oil Co., Muslow 4, 5-20n-15w	35	1520
Magnolia, Doan-Thigpen 31, 5-20n-15w	15	1505
McDonald & Campbell, Youree 17, 13-20n-15w	50	2272

Claiborne Parish (Sugar Creek)—

Union Prod. Co., Carter Unit 2, 33-20n-5w	200	6037

La Salle Parish (Olla)—

Arkansas Fuel Oil, Kees C-1, 7-10n-3e	100	2215
Placid Oil Co., La. Cent. Lbr. Co. 77, 26-10n-2e	96	2400
La. Cent. Lbr. Co. 78, 24-10n-2e	100	2398
La. Cent. Lbr. Co. 79, 24-10n-2e	115	2461

Ouachita Parish (Monroe)—

Carbons Cons, White 2, 34-19n-3e	¶8.0	2200

Michigan

Allegan County—

W. L. McClanahan, Campaigner 1, sw se se 11-4n-14w	135	1554
Lang & Lewis, Flesser 4, se ne sw 15-4n-13w	35	1568
Michigan Devonian, Smith 2, ne se nw 15-4n-13w	130	1585
Miller Bros., Foster 1, se sw sw 16-1n-13w	60	1363

Arenac County—

United Drillers & Producers, Klein 2, nw se se 23-19n-3e	220	2170
Don Rayburn, Marsh 2, sw nw ne 26-19n-3e	96	2990

Gladwin County—

Rowmor Corp., Reynolds 1, c e½ ne nw 23-18n-2w	*	3825

Huron County—

Cryden Pet. Corp., McDonald 1, sw ne ne 20-17n-14e	*	1439

Ottawa County—

Swanson Cons. Oil Co., Sutter A1, ne ne ne 33-7n-13w	10	1852
Smith Pet. Co., Fenske 2, se se nw 34-7n-13w	30	1897
Visser 5, sw nw nw 34-7n-13w	35	1793
Strom-Wagner, Zawadski 3, se nw nw 34-7n-13w	100	1817

Saginaw County—

Chartiers Oil Co., Clark 1, nw ne se 1-11n-1e	*	3206

Van Buren County—

Clapsaddle & Harris, Veley 2, ne nw ne 15-1s-14w	*	1293
Fritz 1, se ne se 15-1s-14w	*	1300

Mississippi

Yazoo County (Tinsley Dome)—

Union Prod. Co., Childress 5, 19-10n-2w	650	4975

Montana

Glacier County (Cut Bank)—

Glacier Prod. Co., Miller 6, c ne ne 30-33n-5w	10	2956
Wm. Hanlon, Allotted 5, nw se ne 12-32n-6w	110	3091

Toole County (Kevin-Sunburst)—

Morton O. & Ref. Co., Morton 9, nw nw se 13-34n-2w	100	1428

Nebraska

Nemaha County—

Jackson et al, Shaffer 1, c se se 19-4n-16e	*	2587

Richardson County—

Eckhart et al, Ast 1, swc nw 6-1n-14e	*	2310
Skelly, Wallraff 3, c se nw se 20-1n-16e	600	2253

New Mexico

Eddy County (Wildcats)—

Fred Turner & D.C. DeVito, DeVito 1, se sw se 12-23s-25e	*	1758
Neil Wills-Geo. Abell, Hale 1, sw se sw 12-20s-30e	¶5.0	1848

Eddy County—

Sam Sanders et al, Berry 8, sw nw ne 24-17s-27e	3	476

Lea County (Eunice)—

Continental, State 4-F-1, c ne ne 1-21s-36e	38	3780

Lea County (Lynn)—

Republic Prod. Co., Davis 2, sec sw 34-23s-36e	100	3607

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Lea County (Maljamar)—		
Barney Cockburn, Baish 27-B, c sw sw 27-17s-32e	489	4002
Carper Dr. Co., Simon 4-N, c sw nw 29-17s-32e	130	3779
Lea County (Rhodes)—		
Krupp-Flaherty Oil Co., Moberly 1-C, c nw se 21-26s-37e	840	3254
Lea County (Skelly)—		
R. Olsen Oil Co., Blinebry-Texaco 2-A, c nw nw 30-23s-37e	25	3616

New York

ALLEGANY COUNTY

W. J. Richardson, Gadsby farm, Bolivar	6	1579
C. H. Christmas & Son, Underwood farm, Scio	6	1449
McEbenwood Oil Co., Horan farm, Andover	6	1438
Rufus B. Scott, Scott farm, Bolivar.	2	1536
Water Intake Wells—		
Ebenezer Oil Co., Herric farm, Alma	...	1388
Messer Oil Co., Miles farm, Bolivar	...	1421
Bradley Prod. Corp., Lewis farm, Alma	...	1565
Sawyer farm, Bolivar	...	1370
L. H. Richardson et al, Browning-Wright farm, Scio	...	973
Jacob Trinkle, Childs farm, Genesee	...	1421

Ohio

Ashtabula County—		
Magnolia, Breley Bros. 1	*	3341
Athens County—		
O'Mara, Continental Coal 2	¶0.04	1110
Cody, Jeffers 4	*	725
Nuzum, Gaul 2	*	1640
C. P. Bowman, Burson 1	*	1621
Coshocton County—		
Ohio Fuel Gas, Fox 1	¶0.03	3424
Geauga County—		
Benedum-Trees, White 1	¶0.04	3938
Hocking County—		
Preston Oil Co., Sunday Creek Coal 1737	*	3563
Holmes County—		
Ohio Fuel Gas, Homer 2	*	3390
Licking County—		
Settles Oil Co., Thompson 1	12	620
Rexroth Oil Co., Walpole 5	2	740
Ohio Fuel Gas, Roe 1	¶0.12	2635
Nat. Dr. Co., Heckleman 1	*	2438
Lorian County—		
Ohio Fuel Gas, Betts 2	*	2570
Medina County—		
A. R. Loop et al, Burnham 1	5	580
Burnham 3	5	596
East Ohio Gas, Hange 2	¶2.5	2483
Glenn Harmon, Monosmith 2	*	2689
Marine Trust Co., Ross 16-O	I	465
Meigs County—		
Nelson, Bengel 4	¶0.08	850
Monroe County—		
Spangler et al, McCort 1	¶0.07	1673
Barnesville Dev. Co., Pittman 1	*	1705
Muskingum County—		
Pure Oil, Watson 1	¶2.2	4212
Arco Oil Co., Frick 1	¶2.5	3779
Noble County—		
Bartlesville Dev. Co., Heizzler 1	¶0.13	5800
Chaseville O.&G., Henderson 1	*	1696
Perry County—		
Ohio Fuel Gas, Winegartner 1	*	2741
C. Z. Ruth, Rodgers 23	*	1173
Stark County—		
J. C. Steiner et al, Baughman 1	*	4557
East Ohio Gas, Linder 2	*	4750
Tuscarawas County—		
J. A. Upham, Mutti 1	¶0.06	4692
Hartman, Couts 1	*	1246
Washington County—		
Porter, Hardy 2	¶0.2	1386
J. T. Hall et al, Hall 2	¶0.04	2117

"I" indicates injection well.

Oklahoma

Carter County—		
O'Conner, Gill 1, sw ne se se 17-4s-2w	*	2563
Gibson et al, Griffin 5, nw sw ne se 20-4s-2w	215	2088
Carter, Walker-Voorhees 7, sw sw nw sw 21-4s-2w	232	2262
Turner, Stearns 5, nw ne sw sw 21-4s-2w	185	2270
Stearns 6, ne ne sw sw 21-4s-2w	130	2268
Stearns 7, ne se sw sw 21-4s-2w	72	2339
Shell, Tubbl 47-A, nw sw nw nw 24-4s-3w	48	1319
Creek County—		
Tibbins, Harry "A" 2, se nw nw 9-14n-10e	30	3166
Wright, Fee 9, sw se sw 19-17n-11e	*	2427
Franchot, Kiefer 37, nw ne se sw 17-17n-12e	7	1503
Sinclair Prairie, Kiefer 38, ne nw sw se 17-17n-12e	12	1510
Foley 1, sw ne nw 29-18n-12e (otd 1533)	1	1571
Garvin County—		
Cox et al, Pape 3, se sw sw 29-1n-3w	50	2275
Grady County—		
Sinclair Prairie, Pooler "B" 2, nw ne ne 22-5n-8w	¶38.0	4262
Oklahoma Nat. Gas et al, Sanford 1-B, sw nwc sw 23-5n-8w	¶198.3	4291
Lincoln County—		
Laffoon O. & G. Co., Stewart 1, sw ne nw 15-13n-6e (otd 4294)	¶26.0	4105
Logan County—		
Mid-Continent, West Dobson 1, swc se 11-17n-1w (otd 5124)	178	4940
Muskogee County—		
Pen-Mar, Jackson 2, se sw se nw 17-13n-16e (otd 2095)	15	2118
Noble County—		
Stanolind, DeBord "B" 6, se nw sw 27-22n-2w (otd 4881)	10	3840
Okfuskee County—		
Viersen, Meyers 1, se ne ne 1-11n-6e	*	4606
Snyder et al, Berryhill 4, c se nw 35-11n-9e	10	1500
I.T.I.O., Miller 2, nwc sw 35-12n-8e	1001	3575
Shell, Curry 3, nw sw nw 35-12n-8e	1344	3635
Davon, Sporleder 1, c sw nw 35-12n-9e	*	3978
Vierson, Leonard 1, sw se nw 11-13n-7e (pb 2619)	7	3594
Oklahoma County—		
Phillips, Mercer 1, nw ne nw 34-12n-3w	334	6595
Okmulgee County—		
Steigner, Colbert 6-A, nw sw ne ne 14-14n-14e	5	1112
Casselman, Thomas 14, sw nw sw se 23-14n-14e	5	1014
Osage County—		
Oklahoma Nat. Blackburn 1, nwc ne 29-22n-12e	*	1686
Lamar, 73, se nec 25-27-10e	*	1908
Blackwell, 2, sw ne se 9-28n-11e	24	954
Pawnee County—		
Wright, School Land 2, sec sw 13-21n-7e (otd 2663)	50	2732
Payne County—		
Amerada, Fruin 4, c e½ se nw 12-17n-1e (otd 4850)	1472	4667
Helmerich & Payne, Freeman 1, nwc sw 2-17n-2e	*	4918
Pittsburg County—		
Choctaw Gas Co., Gilstrap 1, se sw ne 23-7n-17e	¶2.5	2350
Pontotoc County—		
Cornell, Gray "B" 2, nw ne sw 25-5n-4e	105	2575
Patterson et al, Yates 1, c sw se 24-5n-6e	*	1993
Pottawatomie County—		
Kerlyn, Ogee 2, sw nw ne 17-7n-5e	*	3386
Magnolia, Tull-Fyke "D" 3, se ne nw 29-7n-5e (otd 4103)	45	4165
Barnsdall, Robertson 3, sw ne se 30-8n-4e	336	4366
Sokla Corp., McGee 1, sw se nw 31-11n-4e	10	4505
Seminole County—		
Davis, Jones 2, sw ne sw 34-6n-5e	50	2218
Josaline, Caesar 2-A, ne se ne 11-7n-6e (pb 2500)	*	3140
Pioneer, Reed 2, nw sw se 27-8n-8e (otd 4213)	210	4026
Amerada, Campbell 1, c n½ sw sw 30-9n-6e	460	4274
Stephens County—		
Gulf et al, Qualls 1, c sw ne 23-1n-7w	*	10,157
Raizen Bros., Brown 17, se nw se 2-2s-5w (otd 677)	4	1055
Brown et al, Dilley 1, c se se 6-3s-5w (pb 1300)	*	1838
Tulsa County—		
Egan, Bell 2-A, nw sw nw 5-19n-11e	*	1701
Barth Dr. Co., Ellison 1, sw swc 1-19n-14e	¶2.0	1197
Continental, Butts 6, sw se nw nw 36-22n-12e (otd 1237)	*	1265
Wagoner County—		
Price, Morton 3, cwl se nw 18-17n-17e	¶0.07	940

Pennsylvania

BRADFORD DISTRICT

N. V. V. Franchot, Mgr., Franchot & Meridan	5	...
Jacob Meridan, Harbel & Meridan	½	...
Messer Oil Corp., Loop	1½	...
G. H. Smith, Smith Est.	2	...
Pine Run Oil Co., 130-1-2-3-4-6 Bing	5	...
Forest Oil Corp.	1	...
Forest Pet. Co.	1	...
Niagara Oil Corp., 2 wells	2	...
Bradford Tr. Co., 18 wells	18	...
Water Intake Wells—		
Grant & Mohan Oil Co., 486-7 Bing.	...	...
Forest Oil Corp.	...	...
Forest Pet. Corp., 2 wells	...	...

NEW YORK-PENN GAS AREA

Hiawatha Oil Co., Williams	*	...
Belmont Quad. Dr. Corp., Thomas Caslin	*	...

MIDDLE DISTRICT

Venango Oil & Land Co., Lower Reno	½	...
C. S. Ehret, Stull	5/12	...
Duke & Brick, Duke	2	...
McCool Bros., Lot 80	2	...

BUTLER-ARMSTRONG DISTRICT

Hutchison & Burneyt, Frank Eichner	...	...

SOUTHWEST DISTRICT

Allegheny County—		
Stock Co., Chubb 1	1	2020
Armstrong County—		
Penn Wayne Co., Clever 2	¶0.08	3500
Equitable Gas, Hooper 1	¶0.01	3638
Clarion County—		
T. W. Phillips, Buffington 1	¶0.07	3050
Miller 1	¶0.02	5039
Washington County—		
Carnegie Nat. Gas, Nicholl 1	¶0.54	2420
Redd 4	¶0.06	2823

East Texas

Kilgore Area—		
Hamill & Smith, Inc., Culp 6 (63/100-ac), blk 1	1250	3572
Hughey 5 (1-ac), blk 123	750	3567
Knowles 9 (1.53-ac), blk 134	1000	3542
Overton Ref. Co., I&GN Ry. 20-B (7.88-ac)	960	3563
H. L. Swindler et al, Mayfield 11	1200	3721
Longview Area—		
The Pet. Corp., Colburn 15 (36.85-ac)	3000	3605
Peyton Bros., Jones 5 (5-ac)	3600	3575
Sklar Oil Corp., Alexander 6 (20-ac)	1500	3574
M. E. Trapp et al, Anderson-Crisp 2 (1.88-ac)	2400	3560
J. Wrather-Overton Ref. Co., Tubbs 2 (6.33-ac)	500	3593
Anderson County (Long Lake)—		
H. P. Pyle-M. P. Springer, Reagan 1 (dual well)	¶80.0 & 177	5277
Franklin County (Talco)—		
Texas Co., Baker 20 (468-ac)	84	4279
Freestone County (Cayuga)—		
Tide Water-Seaboard, Moody 3	193	4026
McLennan County (Wildcat)—		
Russ & Sanders, McBride 1	*	820
Navarro County (Richland)—		
C. L. Brown et al, Taylor 1	*	3029
Navarro County (Corsicana-Powell)—		
Guy Sitton et al, Cerf 1	*	2153
Speed Oil Co., Sevink 1	*	990
Navarro County (Wortham)—		
J. B. Daniels et al, Kleinschmidt 1	*	3200

West Texas

Andrews County (Means)—		
Humble, Means 29	*	4546
Crane County (Sand Hills)—		
Gulf, Waddell et al 14	7709	4524
Waddell et al 15	1093	4488
Crockett County (Soma-Noelke)—		
Pittman-Cox-Atkins, Noelke 1	13,704	1136
Ector County (Douro)—		
Forest Dev. Corp., Bradley 2	*	4394
Ector County (Foster)—		
Atlantic Ref., Brock-Jones 3	1507	4120
I.T.I.O., Johnson 2-E	604	4155
Ohio Oil, Johnson 2	627	4148
Ector County (North Cowden)—		
Cities Service, Rhodes 10	1997	4195
Carl King et al, Holt-Sinclair 1	714	4315
Gaines County (Seminole)—		
Amerada, Averitt 3	177	5233
Magnolia & Atlantic, H. & J. 6-195	530	5231
H. & J. 4-217	443	5323
H. & J. 14-219	568	5259
H. & J. 7-251	552	5299
H. & J. 8-251	670	5281
Skelly Oil, Mann 4	519	5255
Hockley County (Slaughter)—		
Harry Bass & Dillard, Heffner-Forehand 2	1159	5000
Pecos County (Wildcat)—		
M. D. O'Quinn-Patillo et al, O'Neal 1	23	1675
Pecos County (Lehn)—		
K. Kimberlin et al, Boren-Humble 1	50	1716
Pecos County (Taylor-Link)—		
H. G. Eastham et al, University 3-A	*	1628
University 4-B	168	1613
Ward County (Wildcat)—		
Gulf, Wristen 5 (pb to 7075)	3049	9187
Ward County—		
Texas Co., University 7-E	3132	2685
Yoakum County (Wasson)—		
Aloco Oil Co., Miller-Texaco 8-B	1533	5193
Basin States Oil Co., Fisher-Walker 4	1529	5200
Amon Carter-Continental, Willard 8-38	1612	5045
Humble Randall 8	567	5102
J. E. Mabee O&G Co, Willard 2-D	455	5191

United States Well Completions—*Continued*

West Central Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Brown County (Wildcat)—		
Hogan & Stewart, Ford 1	*	895
Jones County—		
King Oil Co., Almquist 1	70	3240
Pet. Producers Co., Bryant-Link 4	348	1868
Palo Pinto County—		
Hickok P&D Co.-Harry Reynolds, Gauldin 2	*	5250
Palo Pinto O.&G. Corp., Mt. Marion 6	160	2997
San Saba County (Wildcat)—		
3 Widows Oil Co., Ballard 1	*	1962
Shackelford County—		
W. A. Cox et al, Pool 1	*	387
Fortex Oil Corp., Newell 1-a	40	1183
Gorsuch Oil Co., Gorsuch 7	*	1558
Hickok P&D Co.-H. Reynolds, Nall 10-A	80	1587
P. S. Kendrick et al, Mathews 1	*	840
Shackelford County (Wildcat)—		
Hedrick Oil Co. et al, Newell 1	*	1535

Texas Panhandle

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
Magnolia, Fee (Tr. 244) 93	195	3138
Gray County—		
Gulf, Worley-Combs 3	280	3100
Magnolia, Fee (Tr. 227) 39	112	3081
Northern Natural Gas Co., Hodges-Heap 1,	¶2.1	2815
Sinclair Prairie, Worley 3	182	3136
S.&M. Oil Co., Worley 9	117	3285
Stanolind, Hood 12	387	3073
Hutchinson County—		
Cree & Hoover, Halle 8-B	130	3046
J. M. Huber Corp., Riley 2	¶9.1	3160
Kewanee Oil Co., Lewis 50	135	3050
Phillips Pet. Co., Perkins 27	255	3032
Jordan 11	165	3117
Shell, Harvey Sisters 4-B	343	3062
Wheeler County—		
Gramp Oil Co., Sammons 1-B	*	2265

North Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County (Hull-Silk)—		
L. T. Burns et al, Gray-Thweatt 2	*	4424
Dillard-White-Duncan, Nichols 14	888	4400
Bert Ligon et al, Moss 5-A	504	4292
Magnolia, Rutty 15 (pb to 3786 ft)	756	4710
Archer County (Mankins)—		
British-American O.P.Co., Parkey 3	1020	4795
Archer County (McCrory)—		
Fain-McGaha Oil Corp., Nichols 1-A	*	4802
Archer County—		
J. L. Alexander et al, White 5	7	470
G. E. Kisterman, Harron 2	*	920
Archer County (Wildcat)—		
E. C. Harlin, Jr., Baker 1	*	1168
Clay County (Halsell)—		
Bridwell Oil Co., Halsell 3-B	174	4725
Clay County—		
Gorman et al, Taylor 14	10	1139
Taylor 15	15	1148
Cooke County—		
C. J. Bohner et al, Sicking 1	204	1297
Bridwell Oil Co., Flusche 8-A	38	809
Flusche 10-B	65	809
W. H. Metzner et al, Eberhart 1	*	830
Whitfield-Pearson-Grimes, Sicking 3	249	1275
Cooke County (Wildcat)—		
Dick Eubanks et al, Seagraves 1	*	2140
Haskell County (Nowels)—		
J. C. Hunter-Roberts-Fain-McGaha, Strand 1	*	3429
Montague County—		
Claymount Oil Co., Bouldin-Texaco 5	10	816
W. H. Yeargin et al, Maddox 8	8	894
Montague County (Benton-Holmes)—		
L. S. Flannery, Inc., 1st Nat'l Bank 2	840	3903
Wichita County (K-M-A)—		
A. R. Dillard et al, K.&K. 1-B	*	3907
R. P. Dorlan & Barnes, Barnes 1-B	73	4054
J. E. Farrell et al, Bradley 3	*	4000
Hanlon & Buchanan, Inc., Burnett 1-A (pb to 4162 ft)	30	4881
Lewis Prod. Co., Wichita Nat'l Bank 9	63	3801
Shell & Phillips Pet., Griffin 16	580	3818
Wichita County—		
L. T. Burns et al, Robinson 1	*	1930
Coppock & Coleman, Warren 1	25	1508
H. G. Gray et al, Jackson 1	*	659
Hall-Jordan Oil Co., Warren 2	*	1294
Warren 4	†	1689
C. C. Winfrey et al, Davis 1	*	801
Wolfe & Hull, Daume 3	20	708
Wilbarger County (Wildcat)—		
C. M. Barnes & Andrews, Clardia 1	*	3005
Wilbarger County—		
Christie-Hickman Dr. Co., Waggoner Est. 1	13	1912
Wilbarger County (Sigler Deep)—		
Davis Oil Corp., Waggoner-Smith 6	70	3600
Young County—		
C. B. King et al, Brown 2	12	553
R. H. Larsen et al, Kirkland 1	*	715
H. B. Sparks et al, Clark 3	38	877
Young County (Wildcat)—		
A. Kriss et al, Willard 1	*	1003

Texas Gulf Coast

Company, Well and Location	Init. Prod. Bbls.	Depth
Anahuac—		
Gulf, Willcox 16	519	7042
Blue Ridge—		
R. L. P. Prod., Gulf-Luscher 4	399	3760
Clam Lake—		
Shell, McFaddin-State 7	*	6528
Conroe—		
Strake, Etheridge 8	14	5045
Dickinson—		
Pure, Kohfeldt B-1	¶	8755
Esperson—		
W. P. Luse, Hlavaty 3	607	6542
Fairbanks—		
Amerada, Foley 30	148	6849
Hull—		
Guinn, Abel 18	37	764
Joes Lake—		
Republic, Hurd 48	368	7710
Magnet—		
Humble, Cockburn 30	93	5543
North Markham—		
Ohio, Carlson 3	223	7984
Old Ocean—		
Harrison & Abercrombie, Rimmer-Chenault 1	277	10,175
Pierce Junction—		
Rio Bravo, Settegast B-16	343	3429
Saratoga—		
H. L. Lewis, Hopkins 1-A	257	745
South China—		
Titanic, Guiterman 1	212	7565
South Liberty—		
Guinn, Harrison 13	205	2204
Spurger—		
Republic, Sterne Fee 5	¶	4927
Wharton County—		
Texas, Wyer 1, n Louise	*	4010

South Texas

CORPUS CHRISTI DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Calhoun County (Wildcat)—		
Coronado Corp., Welder 6, sec 2, 6800 ft n Duck Bay	*	6008
Calhoun County (Wildcat)—		
R. N. Ranger, Frazier & Crow, Stutzenbecker 1, blk 5, Valentine Garcia gr	*	6511
Dewitt County (Wildcat)—		
George B. White et al, Poetter 1, ½ mi nw Slick fld.	*	4509
Hidalgo County (Samfordyce)—		
John Messenger, Victorino Garza Chapa 2-A	*	3434
Fayette County (Wildcat)—		
O. C. Garvey, Meyer et al 1, James Murphy sur, 3 mi ne Fayetteville	*	5865
Jackson County (Lolita)—		
Magnolia, Hamilton 1	450	5931
Mitchell 6	800	5283
Shell Oil, Willoughby 3	400	5950
Jackson County (West Ranch)—		
Magnolia, Turner 6	500	5769
West 118-A	100	5567
Phillips Pet., Seidel 3	900	5826
Shell Oil, Schuech	125	5764
Jackson County (West Ganado)—		
Pure Oil, Fowler et al 1	*	6177
Jim Wells (Ben Bolt)—		
Bridwell Oil Co., Hoffman 5-B	600	5261
Jim Wells County (Wade City)—		
Anderson-Prichard, Mueller 9	450	4904
Henshaw Bros., Wendt 5	450	4795
Live Oak County (Wildcat)—		
Henderson Coquat, McLean 1, Luis Romaro sur	*	3596
Nueces County (Stratton County)—		
Conroe Dr. Co., Sellers 1-B	450	6475
Corpus Christi Corp., Wardner 12	850	6602
Southern Minerals Corp., Sellers 3	450	6681
Nueces County (E. Flour Bluff)—		
Humble, Flour Bluff-State 3-E	†	8395
Nueces County (Wildcat)—		
Gillespie and Sons, Dabney 1, sec 80, se Banquette	¶96.0 &	7503
Victoria County (Heyser)—		
Gulf, Traylor 46-B	600	5493

LAREDO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Duval County (Cedro Hill)—		
Magnolia, Duval Co. Ranch Co. 19 (132)	35	1464
Duval County (Hoffman)—		
Cuellar Bros. Oil Co., Cuellar 3	51	2890
Duval County (Wildcat)—		
W. C. Butler, Labbe et al 1, H&GN sur 2	¶4.0	2897
Jim Hogg County (Colorado)—		
Humble, King Ranch-Colorado 1-B	350	2969
King Ranch-Colorado 2-B	450	2990
Sun Oil, Thaxton 13	220	2943
Jim Hogg County (Manila)—		
Bridwell Oil Co., Allen 1	80	2662
Jim Hogg County (Wildcat)—		
Jay Simmons & V. G. Schimmel, Gutierrez 1-A	*	3615
McMullen County (Wildcat)—		
Edwin M. Jones, Ezzell 99, Thomas Adads sur	¶10.0	1197
Starr County (Rincon)—		
Continental Oil, Slick Est. 18-A	425	4200
Slick Est. 39-A	500	4263
Webb County (Cole-Brunl)—		
Highland Oil Co., Bruni Est. 4 (OWDD fr 3412)	150	3973
Webb County (Wildcat)—		
Cash and Reynolds, Frost 2, Sec 29	*	2250

SAN ANTONIO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Caldwell County (Dale-Bee Creek)—		
Ralph R. Ogden, Miears 6	*	2347
Caldwell County (Salt Flats-Tinney Creek)—		
Wiegand Bros., Brown 1	250	2460
Frio County (Pearsall)—		
Falcon Seaboard & Dunwoody, Malms Est. 2	400	3975
Milam County (Minerva-Rockdale)—		
C. Y. McCormick, Robinson 2	4	652
Williamson County (Thrall)—		
Magnolia, Stiles 73	*	958
Wilson County (Wildcat)—		
Texminn Oil Co., McDaniel 1, Augustin Garza sur 46	*	138

West Virginia

Company, Well and Location	Init. Prod. Bbls.	Depth
Boone County—		
Owens-Libby-Owens, Peytona Coal Land 34	¶0.07	5130
Braxton County—		
Pitts. & W.Va. Gas, Hall et al 7771	¶0.26	1882
Calhoun County—		
McCall Dr. Co., Kelly 2	10	2289
W. H. Bickel, Snider 1	1	2090
Bowser O.&G., Burrows 2	¶0.06	1922
Clay County—		
Thompson Gas Co., Thompson Land & Coal 50	*	1985
Gilmer County—		
Bruce Haney, Scott 1	10	1652
Hope Nat. Gas, Snodgrass 8516	¶0.03	2290
Jackson County—		
United Fuel Gas, Good et al 4886	¶3.0	4994
Kanawha County—		
United Carbon, Burdette et al 1	2.4	5055
Tolley 1	¶1.12	5048
Godfrey L. Cabot, Morton 5	¶0.85	5052
Marion County—		
Victor E. Tennant, Toothman 1	¶0.05	2700
Monongalia County—		
Gilmore-Hoffman et al, Cumberledge 1	¶0.26	3235
Pleasants County—		
W. C. Patterson Oil Co., Conway 3	3	1624
Putnam County—		
Mercer Gas Co., Mercer 1	¶0.76	1678
Ritchie County—		
Pitts. & W.Va. Gas, Heckert 6117	*	2405
Roane County—		
O. H. Reed et al, Hughes 4	*	1574
Wayne County—		
R. D. Adkins, Stiltner 1	*	3000

Wyoming

Company, Well and Location	Init. Prod. Bbls.	Depth
Sweetwater County (East Hiawatha)—		
Vermillion Oil Co., Horrocks 1, sw sw sw 7-12n-99w	¶3.0	3594
Sweetwater County (Middle Baxter)—		
Red Desert Corp., Aspden 1, c nw sw nw 34-18n-103w	*	6302
Weston County (Osage)—		
C. L. Foster, Unknown 1, sw se 7-46n-63w	*	982

Texas Permits

The Texas Railroad Commission issued permits last week for drilling 234 wells in Texas, 20 less than were authorized the week before.

A total of 43 permits were granted in the East Texas field, with 38 in Gregg, two in Rusk, two in Smith and one in Upshur County. From the remaining portion of the East Central Texas area, 17 locations were reported.

There were 51 permits granted in Southwest Texas, including 10 in Nueces County, while operators in the Gulf Coast were allowed to drill 32 wells, including 12 in Harris County.

The commission approved permits for 11 wells in the Panhandle, 19 in West Central Texas, 26 in West Texas, and 35 in the North Texas district, including 10 in Archer County.

WILDCAT REPORT
New Starts and Completions

CALIFORNIA
FIRST REPORT

Santa Barbara County—Texas Co.'s Bishop A-2, sec 13-4-29, lcn, Elwood-Coal Oil Point area.

KANSAS
FIRST REPORTS

Brown County—McAlpine et al's Tyler 1, ne sw sw 4-3-15e, dr.
Ellis County—Piggott et al's Kuhn 1, c n½ ne nw 17-14-16w, rur.
Franklin County—Schultz et al's Davis 1, c s½ sw nw 28-18-18e, sd 1260 ft.
Greenwood County—Ash et al's Taylor B-1, nw ne nw 7-27-12e, dr.
Russell County—Wakefield et al's Holland 1, c e½ ne se 30-13-13w, lcn.
Sedgwick County—Olson Oil Co.'s Mecredic 1, c n½ ne ne 15-29-2w, dr.

COMPLETIONS

Barton County—Continental's Karst 1, nw ne nw 12-16-15w, 3 mi se Boxberger pool, Lansing 3159 ft, sso 3,256-62 ft, Sooy 3397 ft, Arbuckle 3413 ft, abnd 3421 ft. Allen et al's Benjamin 1, c w½ sw se 3-19-13w, 4 mi n Great Bend, Topeka 2850 ft, Lansing 3205 ft, Sooy 3434 ft, Arbuckle 3449 ft, abnd 3485 ft.
Butler County—Boline et al's Parsley 1-A, nwc ne 23-25-4e, between El Dorado and Pierce pools, Bartlesville 1424 ft, hfw, abnd 1444 ft.
Pratt County—Marylyn Oil Co. et al's Jackson 1, c e½ ne nw 1-27-13w, 1¼ mi ne Iuka pool, Simpson 4201 ft, Arbuckle 4315 ft, td 4342 ft, pb 4337 ft, shot 50 qts 4230-37 ft, abnd.
Rooks County—Cities Service's Johnston 1, swc ne 5-6-19w, 5 mi e Ray pool, Topeka 2990 ft, Lansing 3300 ft, base Kansas City 3448 ft, Erosional Arbuckle 3518 ft, Arbuckle 3589 ft, Granite 3669 ft, abnd 3670 ft.
Russell County—Magnolia's Borrell 1, csl se ne 32-14-12w, Northwest Greenvale disc, Kansas City 2865-86 ft, td 2889 ft, 319 bbls.

SOUTH LOUISIANA
COMPLETIONS

Acadia Parish—Humble's Freeland 1, sec 27-10s-1e, new sd South Crowley, flwd 76 bbl. 34.1-gr oil dly via ⅛-inch ch, tbg/csg pressure 575/1525 lbs, sd at 7093-97 ft.
Iberia Parish—Texas' State Lake Peigneur 4, in lake, disc new sd Jefferson Island fld, flwg 66 bbl 28.6-gr oil dly from 3000 ft, ¼-in ch, tbg press, 45 lbs.
Jefferson Davis Parish—Shell's Heyd 32, new sd Iowa fld, flwg 355 bbl 47-gr oil via ¼-in ch from 7570-73 ft, tbg/csg pressure 2750/2550 lbs.
Plaquemines Parish—Gulf's Timolat 1-B, new fld West Bay, sec 36-22s-30e, flwg 456 bbl 32-gr oil dly via 3/16-in ch from 7265-85 ft, tbg/csg pressures 1350/600 lbs, open hole comp.
St. Martin Parish—Frank Campbell's (formerly Martex) Darby 1, sec 56-11s-6e, Spanish Lake pros, abnd 8011 ft. Shell's Iberville Land Co. 2, sec 87-7s-8e, new sd Happytown fld, flwd 324 bbl 38.9-gr oil dly via 10/64-in ch, from sd 9947-52 ft, tbg/csg pres 1575/2025 lbs.
St. Mary Parish—Stiochiometrical Minerals Co.'s St. Paul-Bourgeouis 1-F, Linden pros, sec 49-13s-8e, a mi n Jeanerette, abnd 5000 ft.

NORTH LOUISIANA
FIRST REPORT

Catahoula Parish—Smith Bros.' (Houston Texas), McCormick 1, c nw sw 29-11n-8e,

MICHIGAN
FIRST REPORTS

Cheboygan County—Lenoran Pet. Co.'s Commeau 1, se se 23-35n-1e, rig.
Clinton County—Seba Oil and Dev. Inc.'s Ziscke 1, sw sw nw 14-5n-3w, rig.
Isabella County—Burruss & Quinlan's Winesburgs 1, se sw sw 20-14n-5w, rig.
Montcalm County—Columbia O. & G. Co.'s Olson 1, nw nw se 27-11n-7w, dr.

COMPLETIONS

Allegan County—W. L. McClanahan's Campaigner 1, sw se se 11-4n-14w, Traverse 1552 ft, td 1554 ft, 400 ft oil natural, 135 bbls after acid, new fld.
Gladwin County — Rowmor Corporation's Reynolds 1, c e ne nw 23-18n-2w, Dundee 3770 ft, abnd 3825 ft.
Huron County—Cryden Pet. Corp.'s McDonald 1, sw ne ne 20-17n-14e, Traverse 1423 ft, sg & o 1424-27 ft, abnd 1439 ft.
Saginaw County—Chartiers Oil Co.'s Clark 1, nw ne se 1-11n-1e, Dundee 3153 ft, abnd 3206 ft.

NEBRASKA
FIRST REPORTS

Nemaha County—Spoon et al's Gauchat 1, sw nw ne 26-6n-13e, spd and sd.
Pawnee County—Walters et al's Bodie 1, nw ne ne ne 12-1n-9e, rur.
Richardson County—Powers & Stalder et al's Lee 1, ne nw ne 16-1n-14e, sur, pipe.

COMPLETIONS

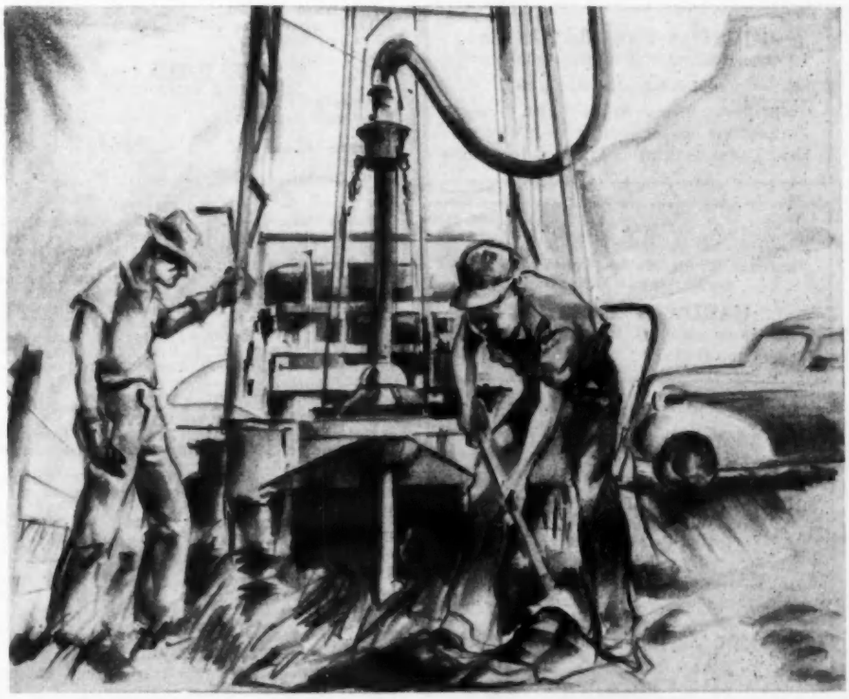
Nemaha County—Jackson & Rust et al's Shaffer 1, c se se 19-4n-16e, 11 mi se Auburn, Bartlesville 1610 ft, Mississippi 2088 ft, Hunton 2548 ft, abnd 2587 ft.
Richardson County—Eckhart et al's Ast 1, swc nw 6-1n-14e, 2 mi nw Ogle pool, Lansing 767 ft, Hunton 2301 ft, abnd 2310 ft.

NEW MEXICO
FIRST REPORTS

Chaves County—R. I. Wilson et al's Brown 1, c nw sw 29-11s-23e, lcn.
Bernadillo County—David H. Boyd et al's Wright 1, c 11-10n-5e, lcn.
Torrance County—J. P. Stewart et al's Lammons 1, c nw ne 3-3n-12e, dr 630 ft.

COMPLETIONS

Eddy County—Turner-Devito et al's 1, se sw se 12-23s-25e, elev 3446 ft, Delaware sand 1533 ft, abnd in sul w 1758 ft. Neil Wills-Abell et al's Hale 1, sw se sw 12-20s-30e, elev 3307 ft, salt series 575-1463 ft, brown lime 1507 ft, pb from water at 1823-48 ft to acidize pay 1540-53 feet, tested 5,000,000 ft sweet gas initial.



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OKLAHOMA

FIRST REPORTS

Creek County—Kirchner et al's Carson 1, ne se nw 23-17n-9e, dr.

Kay County—Williams et al's Trueblood 1-A, sw ne se se 25-25n-1w, sd 1160 ft.

Seminole County—Hall et al's Jackson 1-A, nec se 14-7n-7e, dr.

Texas County—Starr et al's Joliffe 1, c ne ne 28-3n-19e, sd 1612 ft.

COMPLETIONS

Muskogee County—Car Lyon Oil Co.'s Davis 1, sec 24-14n-18e, 3 mi s Jolly-Patton pool, abnd 1175 ft.

Payne County—Helmerich & Payne et al's Freeman 1, nwc sw 2-17n-2e, 3½ mi n Perkins pool, Big li 3875 ft, Oswego 3940 ft, Prue 4075 ft, Verdigras 4110 ft, Skinner 4205 ft, Inola 4230 ft, Bartlesville 4325-75 ft, Mississippi 4430 ft, Base Mississippi 4550 ft, Hunton 4597 ft, Sylvan 4680 ft, Viola 4728 ft, Dense 4758 ft, Dolomite 4778 ft, first Wilcox 4788-4826 ft, second Wilcox 4895-4904 ft, abnd.

Seminole County—Hilton Phillips, Inc. et al's Thorne 1, nw ne ne 3-7n-5e, 2½ mi ne St. Louis pool, Senora li 3132 ft, Earlsboro 3525 ft, Brown li 3826 ft, base Pennsylvanian 3690 ft, Mayes 4100 ft, Woodford 4200 ft, Hunton 4353 ft, Sylvan 4382 ft, Viola 4500 ft, Dense 4540 ft, Dolomite 4575 ft, first Wilcox 4617 ft, cored 4700-05 ft, rec 5 ft dry white sd, abnd 4705 ft.

WEST TEXAS

FIRST REPORTS

Andrews County—Fuhrman Pet. Corp.'s Lockhart-Brown 1, nec PSL sec 24, blk A-42, rur.

Crane County—Gulf's Waddell et al 17, e e¼ of e¼ H&TC sec 15, blk 3, elev 2462 ft, mim for Ordovician test.

COMPLETIONS

Pecos County—M. D. O'Quinn-Patillo et al's O'Neal 1, c s¼ s¼ H&GN sec 74, blk 10, elev 2443 ft, shot 140 qts nitro 1607-75 ft, flowed 23 bbls initial, ¼-in choke, new pool.

Ward County—Gulf's Wristen Bros. 5, east cor w¼ H&TC sec 18, blk 5, elev 2501 ft, base Permian 6330 ft, Silurian crystalline 6930 ft, Simpson 7375 ft, Ellenburger 9002-9187 ft, pb to 7075 ft, acidized Silurian 7010-60 ft, 3049 bbls 32.2-gr oil initial with 1148/1 gas, new pool and first Silurian producer for Texas.

EAST TEXAS

FIRST REPORTS

Rains County—Plains Prod. Co.'s Foster 1, nec 81-ac tr, T. Cummins sur, 1 mi nw Alba, mim.

Smith County—O. L. Ross et al's Willingham 1, 64½-ac tr, Jacob Herrin sur, 2 mi e Whitehouse, rur.

Wood County—Bobby Manziel et al's Lee Bell 1, nwc of Edwin Wideman sur, nw Hawkins, rur.

COMPLETION

McLennan County—Russ & Sanders' Geo. McBride 1, Austin chalk 548-818 ft, abnd 820 ft.

SOUTH TEXAS

FIRST REPORTS

Duval County—Magnolia's Duval County Ranch Co. 10, GC&SF RR sur 290, 1440-ac lse, 7550 ft nw Duval County Ranch Co. 7(289-85) at West Casa Blanca, lcn for 1500-ft test.

Live Oak County—Danciger Oil and Refineries' Lewis 1, 100-ac lse, Thomas Henry sur, ab 14, 3 mi w Three Rivers, sur csg, Arthur J. Coyle, contractor, 1800-ft test.

Nueces County—H. H. Howell's Hellman Bro. 1, E. R. Oliver sur 148, 520-ac lse, ½ mi e Forest Dev. Merritt 1, dry hole, 4 mi sw Clarkwood, 2 mi n Sheild fld, lcn for 7600-ft test. H. H. Howell's Mattiza, 86-ac lse, blk 2, W. B. Baker subd of Cody Part, 1 mi w Violet, 6500-ft test.

Starr County—Sun's Coates 1, CCSD&RGNG sur 515, 540-ac tr, ne W. G. Lehr 1, discovery, elev 451 ft, sp on 5600-ft test.

COMPLETIONS

Calhoun County—Ranger, Frazier and Crow's Stutzenbecker 1, blk 5, Valentin Garcia gr, 5 mi n Port Lavaca, abnd 6511 ft, contracted by Henshaw Bros. Coronado Corp's Welder 6, Sec 2, 6800 ft n Duck Bay fld, abnd 6008 ft.

Duval County—W. C. Butler's Angela Labbe et al 1, H&GN sur 2, ½ mi Labbe fld, est 4,000,000 ft gas, 650 lbs shut-in pres 2897 ft. Robert Coker's Smith-Corkill 1, sur 490, 3 mi s Hoffman fld, abnd 3521 ft, contracted by Long Bros.

Dewitt County—George B. White's Poetter 1, blk 1, Marcus Sewell sur, ½ mi nw Slick fld, temp abnd 4509 ft, Wiegand Bros, contractors.

Fayette County—O. C. Garvey's Meyer et al 1, James Murphy sur, ab 242, farm-out from Texas Co., 3 mi ne Fayetteville, abnd 5865 ft, Houston Dr. Co., cont.

Jim Hogg County—Simmons & Schimmel's Gutierrez 1-A, blk 2, sur 144, 6 mi sw Randado, abnd 3615 ft, Glen Harroun cont.

Live Oak County—Henderson Coquat's McLean 1, L. Romaro sur, 3500 ft nw Oakville fld, prod, abnd 3596 ft.

McMullen County—Edwin M. Jones' Ezzell 99, se 3, Thomas Adams sur, one mile se.

Nueces County—Gilliespie & Son's Dabney 1, sec 80, 3½ miles se Banquette, 35 bbls 56-gr distillate, ⅛-ch, 2450 lbs tubing, 2560 lbs casing pres., perf 7216-21 ft, td 7503 ft, gas/-oil ratio 28,570/1, open flow capacity 96,000,-000 ft.

Webb County—Cash & Reynolds' Forst 2, sec 29, Mirando 2246 ft, abnd 2250 ft Highland Oil Co.'s Bruni 4, Sec 7, dd from 3412 to 3973 ft, sand 3938 ft, 45.45 bbls 44-gr oil, 470 lbs tubing, 1150 casing pres, new sand for Cole Bruni fld.

Wilson County—Texminn Oil Co.'s McDaniel 1, 3454-ac tr, 3 mi e Poth, temp abnd 138 ft, contracted by Mose Harris.

WEST CENTRAL TEXAS

FIRST REPORTS

Eastland County—C. D. Lane et al's Mason 1, nw ne D&DA sec 13, elev 1320 ft, dr 410 ft.

Jones County—Snoddy Bros. et al's Jackson 1, J. McGrew sur 266, dr. 415 ft.

COMPLETIONS

Brown County—Hogan & Stewart's Ford 1, se se H&TB sec 11, blk 11, abnd 895 ft.

San Saba County—Three Widows Oil Co.'s Ballard 1, nwc sw 160-ac H. Behrenroth sur 506, Marble Falls 1700 ft, Barnett shale 1820 ft, abnd in Ellenburger 1890-1962 ft.

Shackelford County—Hedrick Oil Co. et al's Newell 1, nw ne se E. T. Ry sec 2 blk 12, abnd 1535 ft.

NORTH TEXAS

FIRST REPORTS

Archer County—E. C. Harlin, Jr. et al's Waggoner 1, swc sec 30, Clark-Plumb sur, blk 5, spd. Sam Kruger et al's Turbeville 1, sec nw sec 170, Robt. Carson sur, mim. White & Duncan's Snyder 1, nw lot 21, Thos. Toby sur A-643, lcn. L. T. Burns et al's Perkins-Shell 1, nw nw sec 27, league 3, Denton CSL sur, lcn for 2800-ft Canyon test.

Clay County—Perkins & Cullum's Taylor 1-A, nw part blk 44, Bacon subdiv, spd.

Montague County—Sinclair Prairie's Clingingsmith 1, swc blk 149, Belcher subd of J. Olaberry sur A-579, 4 mi sw Nocona, lcn 6500-ft test.

Young County—L. T. Burns et al's Bloodworth 1, nw nw TE&L sec 214, lcn. Kimmell, Lee & Co.'s Campbell 1-B, sec w½ of n 80-ac of s½ TE&L sec 1371, spd.

COMPLETIONS

Archer County—E. C. Harlin, Jr.'s Baker 1, ne nw sec 22, blk 5, Clark-Plumb sur, abnd 1168 ft.

Cooke County—Dick Eubanks et al's Seagraves 1, sec of O. M. Gray sur A-415, 4 mi e Leo, abnd in schist 2140 ft.

Wichita County—L. T. Burns et al's Robinson 1, ne ne sec 310, Waggoner Colony sur, abnd 1930 ft.

Wilbarger County—C. M. Barnes & Andrews' Clarida 1, near c ne ne H&TC sec 97, blk 14, abnd 3005 ft.

Young County—A. Kriss et al's Willard 1, se ne TE&L Co. sec 224, Gunsight 941-43 ft, abnd 1003 ft.

TEXAS GULF COAST

COMPLETION

Wharton County—Texas' Wyer 1, sec 10, W. F. Dobbins Survey, 5 mi n Louise, abnd 4010 ft.

WYOMING

COMPLETION

Sweetwater County—Vermillion Oil Co.'s Horrocks 1, sw sw sw 7-12n-99w, East Hiawatha structure, Southwest Wyoming, new gas pool, ¶3.0, td 3954 ft.

W. G. GREEN, president of Engineering Laboratories, Inc., Tulsa, has been nominated for president of the Tulsa Chapter of Nomads. Gerald S. Westby, president of Seismograph Service Corporation, was nominated for vice president, and Harold M. Cosgrove, executive manager of the Purchasing Agents Association of Tulsa, was proposed for re-election as secretary-treasurer. Election will be held January 17.

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MEN IN THE INDUSTRY'S NEWS

A. CARL POLK, JR., employed as drilling and producing superintendent in West Texas and Gulf Coast fields for the past six years, has been placed in charge of the Texas sales territory of The Billings & Spencer Company, Hartford, Connecticut. Polk, who attended the petroleum engineering school of the University of Oklahoma, is making his headquarters at 1925 Richmond Avenue, Houston.

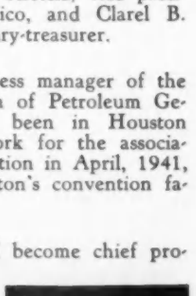
O. L. CORDELL, president of Bareco Oil Company, Tulsa, has announced that he and a group of associates, including Henry Oliver Rea, James C. Rea, George R. Hann and H. V. Blaxter of Pittsburgh, and Edward B. Burling, Washington, have consummated an arrangement to acquire from Barnsdall Oil Company a majority interest in the common stock of Bareco Oil Company. Hann and Blaxter have been elected to the board of directors.

J. D. COLLETT, Fort Worth, and J. C. Hunter, Abilene, Texas, last week were re-elected board chairman and president, respectively, of the Mid-Continent Oil & Gas Association.

With the exception of Wallace Hawkins, Dallas, who was elected vice president for Texas to succeed W. H. Francis, Dallas, all other officers were also renamed. They are: Robert S. Kerr, Oklahoma City, first vice president; F. O. Prior, Tulsa, vice president for Oklahoma; D. W. Harris, Shreveport, vice president for Louisiana-Arkansas; Ralph Pryor, Wichita, vice president for Kansas; Van S. Welch, Artesia, vice president for New Mexico, and Clarel B. Mapes, Tulsa, secretary-treasurer.

J. P. D. HULL, business manager of the American Association of Petroleum Geologists, Tulsa, has been in Houston laying the groundwork for the association's annual convention in April, 1941, and surveying Houston's convention facilities.

J. D. WHEELER will become chief production engineer of The Ohio Oil Company on January 1, and will make his headquarters at Findlay, Ohio. For the past 3½ years, he has been division engineer for the company at Houston. Wheeler joined the company nine years ago as district engineer in East Texas, and then served as West Texas district engineer before being named division engineer at Houston. Early in January, he will commence a tour of the company's properties that will include California and Rocky Mountain holdings. He expects to arrive in Findlay the latter part of January.



N. W. SHIARELLA, Owensboro, was re-elected president of the Kentucky Oil & Gas Association when the organization held its annual meeting December 14 in Louisville. Also renamed were M. A. Arvin, Owensboro; M. G. Powers, Huntington, West Virginia, and P. C. Van Glist, Ashland, vice presidents; E. L. McDonald, secretary, and Paul D. Bushong, assistant secretary-treasurer.

Directors named were M. A. Arvin, Snowden & Mc Sweeney Company, Owensboro; Joshua Bailey, Joseph B. Mayer Company, Owensboro; O. F. Beaty, Magnolia Petroleum Company, Evansville, Ind.; George C. Collins, Collins Oil Company, Frankfort; H. T. Downing, Onsel Bros. & Downing, Bowling Green; E. J. Evans, Evans Oil & Gas Company, Paintsville; M. W. Fowler, South Penn Oil Company, Irvine; A. V. Hoenig, Hoenig Oil Company, Bartlesville, Oklahoma; O. H. Horne, Inland Gas Company, Ashland; W. E. Hupp, Hupp & Duff, Lexington; C. Taber Johnston, Mecca Oil Company, Owensboro; W. H. Keffer, Ashland Oil & Transportation Company, Ashland; J. J. McClelland, The Ohio Oil Company, Owensboro; E. L. McDonald, Ashland Oil & Refining Company, Lexington; J. Fred Miles, The Petroleum Company, Louisville; C. A. Morrison, Producers Pipe Line Company, Owensboro; J. W. Polkinghorn, Kentucky Natural Gas Corporation, Owensboro; M. G. Powers, Bed Rock Petroleum Company, Huntington, West Virginia; E. J. Reading, Sun Oil Company, Evansville, Indiana; E. G. Robinson, Shell Oil Company, Centralia, Illinois; R. C. Rowan, Warfield Natural Gas Company, Charleston, West Virginia; N. W. Shiarella, Miller & Shiarella, Owensboro; W. K. Snyder, Stewart & Snyder, Owensboro; Osman E. Swartz, United Carbon Company, Charleston, West Virginia; P. C. Van Glist, Kentucky-West Virginia Gas Company, Ashland; O. W. Van Petten, Columbia Carbon Company, Charleston, West Virginia; H. C. Wakefield, The Texas Company, Pryse, Kentucky; Earl D. Wallace, Petroleum Exploration Company, Lexington; W. A. Watkins, The Carter Oil Company, Mattoon, Illinois; C. J. Weideman, Cumberland Petroleum Company, Owensboro; J. Frank Wilson, Sohio Corporation, Mt. Vernon, Illinois, and J. A. Yunker, Louisville Gas & Electric Company, Louisville.

F. W. ROLSHAUSEN, chief paleontologist for Humble Oil & Refining Company, Houston, will discuss "Bottom Deposits and Associated Organisms in the Gulf of Mexico" before the Houston Geological Society at a special meeting Tuesday noon, December 31, at the Rice Hotel.

R. P. CLARK, former Kansas representative for Reda Pump Company, Wichita, is now sales engineer for Lucey Products Corporation in Tulsa.

W. K. HANNA, assistant manager of the Philadelphia branch of John A. Roebling's Sons Company, Trenton, New Jersey, has been named manager of the company's Pittsburgh area. Hanna, whose territory includes western Pennsylvania and parts of Maryland, Virginia, West Virginia and Kentucky, joined the company as sales representative in 1919 after a short period as sales representative for Charleston Electric Supply Company, Charleston, West Virginia.

JAMES S. CRATE, 54, secretary and first assistant treasurer of Humble Oil & Refining Company and secretary-treasurer of Petroleum Casualty Company, died December 14 following a heart attack. He joined Humble Oil & Refining Company in 1918, was named cashier in 1919, and three years later became assistant treasurer. In 1925, he became assistant secretary and assistant treasurer, advancing to his latest position in 1938.

ANDREW F. SCHOEPPEL, chairman of the Kansas Corporation Commission, last week was named chairman of the finance committee of the Interstate Compact Commission by Governor Leon C. Phillips, compact chairman. The committee has been charged with recommending methods of financing an expanded program, preparation of budgets, and allocation of expenses to member states. Members are J. C. Hunter, Abilene, Texas, and W. H. McFaddin, Colorado Springs, Colorado.

L. S. MELZER, scout for Stanolind Oil & Gas Company in the north portion of the Permian Basin, embracing part of New Mexico and Texas, has been transferred from Midland to the Fort Worth district office. He has been succeeded by G. G. Galligan.

JOHN H. LANGSTON, chief scout for Sun Oil Company in the Dallas division, was stricken last week and removed to a Dallas hospital.

LEON F. PAYNE, treasurer since 1929 of Oil Well Supply Company, Dallas, has been appointed treasurer of Carnegie-Illinois Steel Corporation and will transfer his headquarters to Pittsburgh. A. C. Wimmer has been advanced from assistant treasurer to fill Payne's former post, while Frank L. Wiegand has been named assistant treasurer of Oil Well Supply Company.

L. F. Payne

Following graduation from Brown University, Payne in 1907 went with Western

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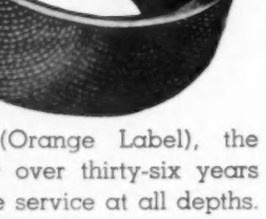

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MEN IN THE INDUSTRY'S NEWS

A. C. Wimmer

F. L. Wiegand

Electric Company. He became associated with the sales department of Carnegie Steel Company in 1909, was made head of the credit department in 1918, and continued in that capacity until he joined Oil Well Supply Company.

Wimmer became associated with Oil Well Supply Company in 1916, and his association with the company has been interrupted only by active service with the A. E. F. during World War I. He was made credit manager of the company's midwest division in 1932, and later was appointed assistant treasurer.

Wiegand has been connected with Oil Well Supply Company since 1898.

JOHN HAMMERMANN, JR., Gulf Oil Corporation, Houston, has been named general chairman, and A. J. Wells, The Carter Oil Company, Tulsa, has been elected general vice chairman of the 1941 standing committee on state and local taxation of the Mid-Continent Oil & Gas Association.

Members of the committee are Frank Abbot, The Texas Company, Houston; R. G. Durst, Humble Oil & Refining Company, Houston; Leo Meyer, Mid-Continent Petroleum Corporation, Tulsa; John P. Morgan, Sun Oil Company, Dallas; A. D. Nelson, Magnolia Petroleum Company, Dallas; L. W. Robertson, Stanolind Oil & Gas Company, Houston; F. N. Shriver, Shell Oil Company, Houston; V. R. Shurmon, Shurmon & Kirkwood, Fort Worth; Jack Stearns, Stanolind Oil & Gas Company, Tulsa; G. W. Patchett, Mid-Continent Oil & Gas Association, Tulsa, committee secretary.

In addition, the following steering committee chairmen have been named: Leo Meyer, Mid-Continent Petroleum Corporation, Tulsa, for Oklahoma; Jack Stearns, Stanolind Oil & Gas Company, Tulsa, for Kansas; R. G. Durst, Humble Oil & Refining Company, Houston, for Texas; L. W. Robertson, Stanolind Oil & Gas Company, Houston, for Louisiana-Arkansas; F. N. Shriver, Shell Oil Company, Houston, for New Mexico; V. R. Shurmon, Shurmon & Kirkwood, Fort Worth, for Mississippi-Alabama-Georgia-Florida; A. D. Nelson, Magnolia Petroleum Company, Dallas, for Illinois-Indiana-Kentucky; Frank Abbot, The Texas Company, Houston, for outside states ad valorum tax, and John P. Morgan, Sun Oil Company, Dallas, for outside states excise tax.

L. M. WILSHIRE, geologist for Skelly Oil Company, has been transferred from Rockport, Missouri, to Tulsa.

CARL HATCH, United States senator from New Mexico, appearing before a hearing by the new Mexico Oil Conservation Commission last week, advocated compulsory repressuring of the nation's oil fields, where possible.

"I am absolutely amazed to learn of the tremendous amount of oil left in the ground by most present methods," he said. "The recovery ratio is only about 15 to 18 percent. With repressuring, it jumps to 30 or 35 percent. Such measures should be made compulsory wherever it is possible to put them into effect."

C. HOMER McDUFF, who a short time ago returned to the United States from Venezuela, where he was drilling superintendent for Standard Oil Company of Venezuela, has been made production superintendent for Southern Production Company, with headquarters in Shreveport. The company is the production unit of Southern Natural Gas Company, Birmingham, and plans to start drilling operations shortly in the Logansport area.

HIRAM M. DOW, Artesia, New Mexico, has been named chairman of a by-laws committee of the Interstate Compact Commission, named last week by Governor Leon C. Phillips, compact chairman. Committee members are P. J. Hoffmaster, Mount Pleasant, Michigan, and W. J. Holloway, Oklahoma City.

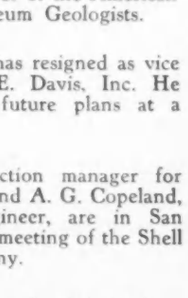
NELSON HORATIO DARTON, Washington geologist and cartographer of a survey map of Lower California, will receive the Penrose Medal of the Geological Society of America during the group's annual meeting in Austin, Texas, this week.

E. T. SEIGLER, 56, retired geologist and oil operator, died December 14 at Hereford, Texas, where he had resided since 1927. He was a member of the American Association of Petroleum Geologists.

ALDEN W. FOSTER has resigned as vice president of Ralph E. Davis, Inc. He will announced his future plans at a later date.

R. W. BOND, production manager for Shell Oil Company, and A. G. Copeland, Jr., exploitation engineer, are in San Francisco attending a meeting of the Shell Development Company.

T. J. COSTELLO, formerly with Parkersburg Rig & Reel Company at Houston, has joined Maloney Tank Manufacturing Company as general Tulsa sales representative, J. S. Warren, company president, announced last week. He had been in the sales division of Parkersburg Rig & Reel Company for the past 15 years.



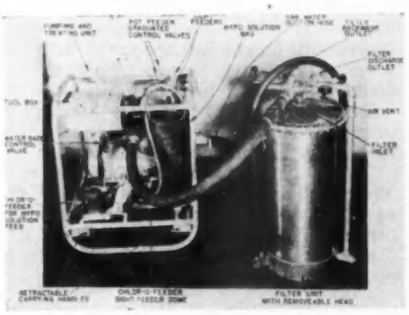
NOTES FOR THE Equipment Buyer and User

Water Purifiers

% PROPORTIONEERS, INC. %

A portable water-purification plant that may be placed in a truck and carried to the job with tools and supplies has been announced by % Proportioneers, Inc. %, 9 Codding Street, Providence, Rhode Island. It is designated Pur-O-Pumper, weighs 750 pounds and occupies a space 4x6x4 feet.

The plant consists of a gasoline-engine-driven centrifugal pump, chlorinating and chemical-feeding equipment mounted on a pipe framework. A monel-metal filter to separate out turbid particles is mounted separately.



Proportioneers' Pur-O-Pumper

In operation, the Pur-O-Pumper is located near a stream, with the suction hose placed in the stream. When the engine is started, water from the stream is treated with coagulant chemicals, soda ash and alum, and chlorine for sterilization as it is pumped into the filter. The filter, which has a bed of sand and gravel, separates out turbid particles. The rate of flow of pure water depends upon turbidity of the raw water, and with 150 parts-per-million turbidity, the unit is rated at 15 gallons per minute of sterilized and clarified water, with 2000 gallons to be pumped without backwashing the filter.

Electrode

METAL & THERMIT CORPORATION

An electrode designed for manual arc welding with transformer type AC welding equipment, designated Murex Alternex, has been announced by Metal & Thermit Corporation, 120 Broadway, New York.

It is recommended for vertical-down-welding, and in the smaller sizes for welding light-gauge steel.

Drum Handler

LEWIS-SHEPARD SALES CORPORATION

A tool to facilitate handling of barrels and drums, designated barrel and drum tipper, has been announced by Lewis-Shepard Sales Corporation, 245 Walnut Street, Watertown, Massachusetts.

The device consists of a handle with an adjustable pronged collar that permits the tipper to fit all types of drums and large- or small-bilged barrels. It is designed to make safe the job of tipping barrels from a horizontal to vertical position, or the reverse. A long handle is designed to increase leverage so that less effort is required to handle a barrel or drum.

Floor Covering

TRUSCON LABORATORIES

A rubber-base coating for wood or concrete floors, designed for use on cement floors and described as unaffected by alkali or moisture, has been announced by Truscon Laboratories, Detroit.

Designated Paratex, the product employs a chlorinated rubber base liquid. It is described as flowing easily and brushing out smoothly so that it may be applied readily with a brush.

Engine Switch

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

A safety switch designed to interrupt operation of internal combustion engines if the lubricating oil pressure drops hazardously low or if the cooling water temperature rises too high, has been announced by Minneapolis-Honeywell Regulator Company, Minneapolis, Minnesota.

Available in two models, P607A has manual reset button which must be depressed until the motor starts and the oil pressure rises to normal, while P607B is designed for use on motors with automatic starting equipment where a means is provided to shunt the circuit around the switch until the motor starts and the oil pressure rises to normal.

For engines with a distributor-type ignition, the device is wired to break circuit on temperature rise or pressure fall; for engines with a magneto type of ignition, the opposite terminals are used which short circuits the primary of the spark coil to the ground, while for Diesel engines, the device is set up to control a solenoid valve installed in the fuel line to the injection system.

Minneapolis-Honeywell Engine Cutout

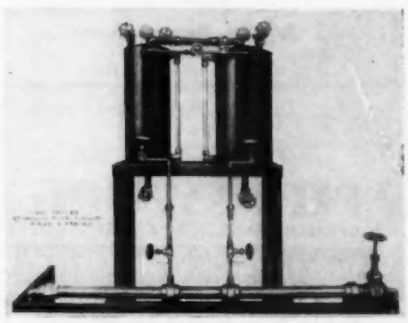
It employs a 4 x ¼-inch temperature element capsule that may be inserted in any ½-inch pipe tapping in the block. There is no separable well to install as a special packing gland is furnished. A mercury switch handles the switching action. The unit is 6⅛ inches high, 5-9/16 inches wide and 2-11/16 inches deep.

Proportioner

D. W. HAERING & COMPANY

A feeder for proportioning liquids into liquids or gases, designated Model B and operating on the pressure difference between pitot tubes, has been announced by D. W. Haering & Company, 2308 South Winchester Avenue, Chicago.

The feeder employs flexible steel tubing on pitot tubes and cross lines to take up stress and shock of water hammer or slight misalignments due to curling of welded connections. Check valve is installed on the needle valve line to prevent reagent backing into the needle valve line and to prevent clogging or corrosion. The arrangement is designed to provide perfect check valve performance and better drop feed indication.



Haering's Model B Proportioner

Gauge glasses are installed on the inside of the units, facing each other, to protect them from accidental damage and to reduce hazard from gauge glass breakage. Overall height of fluid compartments has been increased from previous models to provide greater capacity and safety from red oil losses. The needle valve line has been brought out in front of the tanks to reduce friction loss and gas binding, and to increase sensitivity and accuracy.

Boiler Feed System

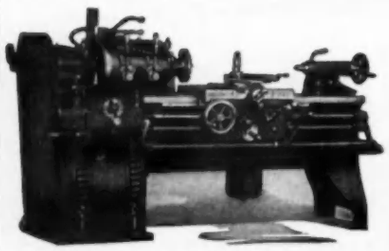
MICRO-WESTON, INC.

A boiler return system designed for boilers up to 750-horsepower and 200 pounds pressure has been announced by Micro-Westco, Inc., Bettendorf, Iowa.

The equipment is designed to automatically return all condensate to boiler in both high- and low-pressure equipment, to add made-up water as needed to compensate for loss of live steam, to maintain a uniform water level in boiler, to keep return lines constantly open, and to eliminate back pressure on return lines.

It employs a turbine-type pump having renewable liners. Over-size shaft and bearings, with bearing adjustment for centering impeller, are designed to prevent galling and seizing and to offer further protection against excessive maintenance expense.

An automatic boiler water-level control starts and stops the boiler feed



The Boye & Emmes Timken Bearing Engine Lathe

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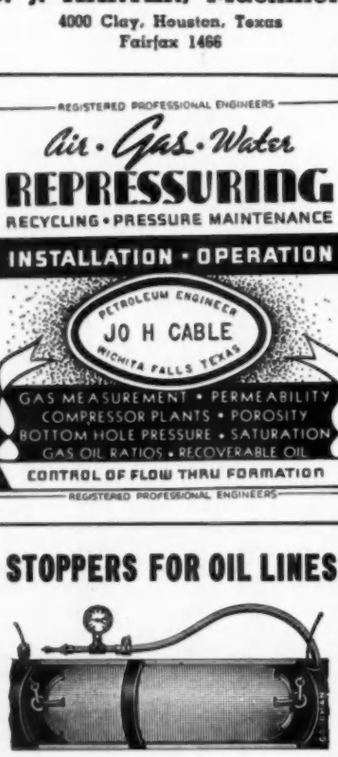
BOTTOM HOLE PRESSURE • SATURATION
GAS OIL RATIOS • RECOVERABLE OIL

CONTROL OF FLOW THRU FORMATION

REGISTERED PROFESSIONAL ENGINEERS

STOPPERS FOR OIL LINES



Send for catalogue

SAFETY GAS MAIN STOPPER CO.
523 Atlantic Ave. Brooklyn, N. Y.

NOTES FOR THE Equipment Buyer and User

Micro-Westco Boiler Feed System

pump to maintain the water level in the boiler within a ¾-inch range, cuts off the burner or stoker if the water in the boiler reaches a dangerously low level, and sounds an alarm when the low water cut-off point is reached. Control is fitted with a Monel float, has bellows to eliminate packing, and is constructed with all operating parts isolated from steam and the hot-water zone.

Portable Compressors

Chicago Pneumatic Tool Company, 6 East 44 Street, New York, has issued the fourth edition of its Bulletin 758 describing its line of two-state air-cooled portable compressors. The entire line has been streamlined. The bulletin illustrates various models and gives specifications, dimensions and weights.

Power Transformers

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania, has issued Descriptive Data Booklet 211 describing its line of self-protecting CSP power transformers. The units are designed to take the place of a complete substation on municipal or industrial distribution systems.

Texasteel Manufacturing Company Embarks on Expansion Program

Texasteel Manufacturing Company has embarked upon an expansion program involving its headquarters at Fort Worth and five Texas oil-field supply stores, Allen J. Armstrong, vice president and general manager, announced last week.

Additional items of oil-field equipment are being added to the company's line of pumping equipment and sucker rods. A new supply store has been built at Odessa, the company's store east of Kilgore is being enlarged, and three new stores will be established in other Texas areas. Plans have been drawn for a new office building at Fort Worth.

The company recently obtained an order for 500,000 81-mm shell cases from the Army Ordnance Department.

Texas Steel Company, parent company of Texasteel Manufacturing Company, is also undergoing an expansion program involving new buildings, new machinery and tools, and new metallurgical laboratories.

Illinois Oil & Gas Directory Issued

Midwest Oil Journal, Centralia, Illinois, has published the second edition of its Semi-Annual Directory of operators, supply companies and other groups active in the Illinois Basin. It is supplemented with information on oil- and gas-producing strata in Illinois, pipe line information, conversion factors and other information of value to users of the volume.

Hard Rubber Equipment

The Luzerne Rubber Company, Trenton, New Jersey, has issued a 20-page bulletin on its line of hard rubber equipment for handling corrosive solutions. It describes pipe and fittings; check and foot valves; globe, angle and straightway valves; float valves; gauge glass fittings; pet cocks and bibcocks; acid handling containers, and centrifugal pumps. Lining and covering of castings with hard rubber are discussed.

Time Switches

General Electric Company, Schnectady, New York, has issued Bulletin GEA-2753 illustrating and briefly describing its hook-on volt-ammeter, portable test instruments, inkless recording instruments, strip-chart recording instruments, round-chart recording instruments, Type KT time meters, general-purpose automatic time switch, automatic process time switch, and automatic repeating time switch.

Fire Protection

Walter Kidde & Company, Bloomfield, New Jersey, has issued Bulletin 508, comprising eight illustrated pages on built-in carbon dioxide fire extinguishing systems. It describes problems involved in adapting this method of fire protection to various industrial hazards.

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★ ★ *Rates* ★ ★
SINGLES $3 TO $4 — DOUBLES $4.50 TO $6

. . . Pittsburgh's Newest Hotel 400 rooms, all with radio at no extra cost, outside view & bath.

A KNOTT HOTEL ★ JOSEPH F. DUDDY, MANAGER

NOTES FOR THE Equipment Buyer and User

Discharger

Cochrane Corporation, 17 & Allegheny Avenue, Philadelphia, has issued Publication 2935 describing its dischargers for high-capacity high-pressure drainage. The equipment, by means of a pilot valve, applies the steam line pressure to open the discharge valve. Displacement weights of different densities move the pilot control valve. When the pilot valve has opened, steam is admitted to the top of the main valve piston, opening the discharge valve. Drains are discharged from the bottom of the body through the eduction pipe to the outlet.

Rubber Goods

New York Rubber Corporation, 9 Rockefeller Plaza, New York, has issued a 20-page catalog describing its line of belting, hose and packing. Types of hose described include rotary, slush-pump suction, water, fire, mill, steam, air, acetylene, oxygen, and sand suction hose. Packing material described includes several types of sheet packing, core packing, round tucks, stuffing box rings, and pump diaphragms. Various products in the company's line are illustrated and specifications given.

Panel Instruments

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania, has issued Catalog Section 43-370 covering its No. 37 line of miniature panel instruments. Approximately 4½ inches in diameter, the instruments are available in three mounting styles and have a broad field of application, from industrial and radio test apparatus to the gadget of the amateur experimenter. The catalog explains features such as dial readability, and interchangeability of instruments. Operating principles are described and illustrations of the instruments are included.

Rubber Protectors

Patterson-Ballagh Corporation, 1900 East 65 Street, Los Angeles, has published a chart in bulletin form showing clearance area between rubber protectors and casing in relation to internal area of tool joints. Data covers all types and sizes of drill pipe, all sizes of protectors, the outside-diameter of the protector on the pipe, and clearance between protector and casing.

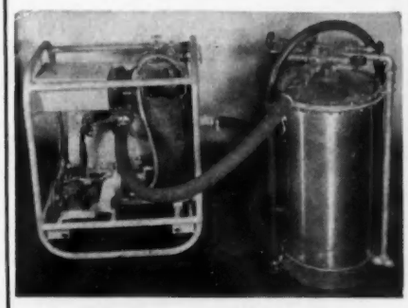
Alloys

Nickel Steel Topics, published by The International Nickel Company, 67 Wall Street, New York, in its December issue contains an item on "Drillers Profit by Use of Alloy Steels." It describes use of alloy steel by The Star Drilling Machine Company, Akron, Ohio.

Blowers

Roots-Connersville Blower Corporation, Connersville, Indiana, has issued Bulletin 21-B-35 describing its Victor-Acme rotary positive blower for handling small and medium volumes of air against pressure or under suction, ranging from 8 ounces to 7 pounds per square inch. The bulletin describes the general operating principle of the blower, gives a table of ratings of the several different sizes, and illustrates the blower in arrangements in which it is furnished.

Pictured are 20 of a 40-unit export order of Ideco streamlined rotaries shipped recently from Beaumont plant of The International Derrick & Equipment Company.



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for oil field use anywhere

The Pur-O-Pumper is a low cost complete portable water purification system, gasoline driven, delivering pure, safe drinking water from any pond or stream. Used by U. S. Army, contractors, refugee camps, etc. The ideal water system for exploration crews, drilling contractors, pipe line gangs, and especially for South American oil fields where tropical water is a hazard.

Delivers 15 G.P.M.—enough to supply 500 men 20 gallons a man per day.

Technical Advice will be gladly furnished. Make your request complete so recommendation can be specific.

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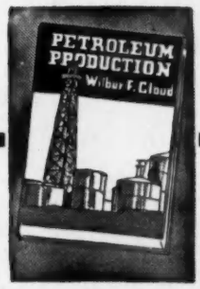

Petroleum Production

By Wilbur F. Cloud

A book dealing with the fundamental operations and technical processes of oil production. It offers to the oil executive, the engineer, and the man in the field a most comprehensive treatment of the subject.

PETROLEUM PRODUCTION contains 613 pages of text, with 280 illustrations and 75 practical tables and charts. Price $5.00. Order your copy today from

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TUBING OF NICKEL...42 to 1: In well where strainers of two other materials failed in less than 30 days, two-inch Nickel tubing showed no measurable corrosion after 3½ years.

These are but three of a dozen money-saving applications of Nickel-base alloys described in "Cut Down Oil Well Replacements." Write for this new folder today. Address:

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SAND-BANUM controls boiler scale and corrosion by preventing its formation and by removing scale that has already formed.

Ready for instant use in 16 oz cans. Use only ounces weekly. 1 can controls a 250 h.p. boiler for one month. Proof awaits your request.

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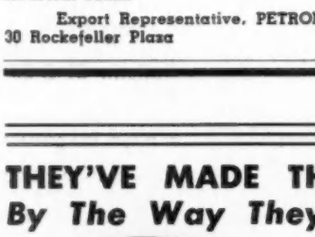
THEY'VE MADE THE GRADE
By The Way They're Made

Dragon Composition—The World's Standard for Deep Wells



Nobs Composition—The World's Standard for Shallow Wells

A quarter-century of SPECIALIZING made Dragon Cups the world's "Grade A" standard. They've earned *that* "grade" by the way they're made.

Made of toughest known materials, to our own *secret* formula, Dragon Cups keep pumpers out of many *tough spots*—saving time, temper and profits.

If you haven't used Dragon, you'll never know the full meaning of STAMINA and PERFORMANCE until you do.

Dragon's "Champion" Cup Line consists of Dragon Composition, Nobs Composition, Dragon Jerker, and Dragon Leather. . . . Call for them by name—DRAGON—at your supply store.

Your name on a business letterhead will bring a sample of each. Mail request TODAY.

The Dragon Mfg. Co.
MARIETTA, OHIO

Remember—wherever you see the "Dragon," it's the symbol of the World's TOUGHEST Valve and Pump Cups.

Squeaks from the Bull Wheel

Tsk, Tsk

Buster, what are you going to give your little brother for Christmas?

I dunno; I gave him the measles last year.

Chronic Change

"But why," said the puzzled judge, "did you break into the same shop three nights running?"

"Well, it was a dress for my wife; and I had to change it twice."

Smart Jimmy

Jimmie giggled when the teacher read the story of a man who swam a river three times before breakfast.

"You do not doubt that a trained swimmer could do that, do you, Jimmie?"

"No, ma'am, but I wonder why he didn't make it four, and get back to the side where his clothes were."

Hot Stuff

Juliet, dearest, I'm burning with love for you.

Come, now, Romeo, don't make a fuel of yourself.

Silly Business

Doctor—I'm sorry, but I'll have to open you up again. I can't find my other rubber glove.

Patient—Don't be silly. Here's a dollar—go out and buy yourself another pair.

Fate's Plaything

"It was grand of you to dive from that height, fully clothed, to effect such a magnificent rescue," said the looker-on, patting the hero.

"That's all very well," said the hero, "but what I want to know is—who pushed me in?"

New Measure

"Boy, dat sho am some ring. What size is de diamon'?"

"Dat am de fo'teen-year-installment size."

Impressive

A young lawyer, pleading his first case, had been retained by a farmer to prosecute a railway company for killing twenty-four hogs. He wanted to impress the jury with the magnitude of the injury.

"Twenty-four hogs, gentlemen! Twenty-four! twice the number there are in the jury box."

More Scotch

"Here's a pass to the carnival," said the Scotchman.

"Thank ye, 'arry," said his wife.

"And hark ye, Bonnie, when he comes to the trick where he takes a teaspoon o' sugar and one egg and makes fifteen sponge cakes, watch ver' careful."

Ready to Start

"Mummy, can angels fly?"

"Yes, darling."

"But nursie can't fly, and daddy calls her his little angel."

"No, but she will fly, dear."

Etc., Etc., Etc.

"What did your wife say about your being out so late?"

"Ask me next week, when she gets through, I'll condense it for you."

The Season

"Say, Bill, if you had five bucks in your pocket, what would you do?"

"Check up to find out whose pants I had on."

Used To It

His wife determined to cure him of his bad ways, and with the aid of a sheet and an electric torch transformed herself into a very fair imitation of a ghost. Then she went to the drunkard and shook him.

"Whas that?" murmured the toper.

"Satan," came the reply in a sepulchral tone.

"Shake handsh, old horsh, I married your sister."

High Geared

"Your boy friend talks too much. He rattles on like a flivver. I'm afraid he's a flat tire."

"I know, Pa, but his clutch is grand."

Almost Universal

"Should I marry a man who lies to me?"

"Lady, do you want to be an old maid?"

Unqualified Success

A woman who had given a dinner party met her doctor on the street the following day.

"I am so sorry, doctor," she said, "that you were unable to come to my party last night. It would have done you good to be there—"

"It has already done me good," he broke in tersely. "I've just prescribed for three of your guests."

Why Men Leave Home

Jones had heard a good riddle at the office, so he decided to try it on his wife.

"Why," he said, the minute he opened the door, "Why am I like a mule?"

"I don't know," said Mrs. Jones. "I know you are, but I don't know why."

Strong Arm Stuff

"Jack's got a lot of culture, hasn't he?"

"Yes, he has; but it's all physical."

Impromptu Material

A country pupil wrote the following "howler" in a recent test paper:

"A minister without portfolio is a clergyman who doesn't need notes in the pulpit."

She Should Know

Conductor—Madam, are all these your children, or is this a picnic?

She—They're all mine, big boy, and take it from me it's no picnic.

Observe de Corps

But what has your boy friend's army career got to do with him staring at every pretty girl he sees?

Oh, he's in the observation corps.

Civilized

Slowly the raft drifted with the flow of the sea. One of the shipwrecked sailors looked into the sky.

"Cheer up," he called; "we can't be far from civilization, 'cos a couple of bombers have just gone over."

Cup That Cheers

"Well, little miss," said the grocer, "what can I do for you?"

"Please, sir, mother wants a bottle of good-natured alcohol."

Greetings!

To our friends everywhere . . . may your Christmas be a merry one, and may the New Year bring a full measure of prosperity and happiness!

MECO

MAINTENANCE ENGINEERING CORPORATION

HOUSTON, TEXAS, U. S. A.

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